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Original Communications.

*NEW THERAPEUTIC AGENCIES.**

By Professor Dujardin-Beaumetz, Paris, France.

SUSPENSION IN LOCOMOTOR ATAXIA.†

GENTLEMEN:—Since the establishment of these lectures at the Cochin Hospital I have treated successively of New Medications, of Alimentary Hygiene, of Hygienic Therapeutics, and of Prophylactic Hygiene. I propose this year to return to my starting-point, and to examine the new medicaments and new medications.

In these times, so great and so rapid is the progress which is being made in all departments of therapeutics, that we shall find in the three years which separate my first from my second conferences on the same subject, a rich and ample harvest of new and interesting facts.

I shall begin with the new therapeutic agencies now being utilized in diseases of the nervous system. This subject I did not take up in my first series of lectures. I do it to-day, the more willingly from the fact that even in affections the most rebellious to treatment, we have certain useful therapeutic agencies of recent acquisition.

* A second series of "New Medications," published in 1887.

† From advance sheets, revised by the author (translated by E. P. Hurd, M.D.). Lectures delivered in Cochin Hospital, Paris, France.

I shall begin with the study of the treatment of chronic affections of the spinal cord, and in two successive lectures I shall examine, first, suspension as applied to the treatment of tabes dorsalis, then the benefits which have been derived from the introduction of the new analgesics in the treatment of these affections. Do not expect of me a complete exposition of these new therapeutic agencies; these lectures will embody much more of personal experience than the preceding, and will set forth more particularly the results of clinical trials and experiments made in this hospital, and I shall leave unnoticed a great many similar facts published in foreign lands.

Within the past few years, the therapeutics of chronic affections of the spinal cord, and, in particular, of the systematized diseases of this nervous centre, have been enriched by precious acquisitions to which it seems fitting for me to call your attention, and I shall take especially for type of the chronic spinal diseases, locomotor ataxia.

Thanks to the contributions of the school of the Salpêtrière, and the impulsion given to that school by its eminent chief, Professor Charcot, our knowledge of the chronic affections of the cord has been greatly extended, and we have been enabled to construct an ever-increasing number of varieties and species.

Unfortunately, therapeutics has not made as rapid progress as clinical observation (*la clinique*), and this is readily understood when you think that at the time when the physician's services are demanded, the medullary alterations already exist. These lesions, which belong to the chronic sclerous inflammations, choke out the nervous elements, and thus produce irremediable disorders, before which therapeutics is powerless. Hitherto the treatment of these chronic interstitial inflammations has consisted principally of the following means: First, revulsion; here the introduction of the Paquelin thermo-cautery has enabled us by punctiform cauterizations to render this revulsion less painful and more easily applicable. In addition to the revulsion produced by fire or heat, there is that which is produced by cold. If the application of ice-bags along the vertebral column, according to Chapman's method, has been abandoned by reason of the complications supervening (pneumonia, grave bronchitis, etc.), it must be admitted at the same time that certain refrigerants, and, in particular, the chloride of methyl, have rendered some service, not so much in arresting the progress of the medullary sclerosis, as in alleviating the intense pain from which ataxic patients sometimes suffer.

The application of chloride of methyl has been perfected of late by the use of certain new instruments made to facilitate the external employment of this agent, as that of Galante. Improvements in the mode of its application have also been devised, as the *stypage* (method by *tamponment*),* introduced by Bailly.

I shall say but little of hydrotherapy, a subject which I have treated at some length in my Clinical Therapeutics† and in my Hygienic Therapeutics. This is a method of treatment which needs to be managed with extreme prudence in the chronic diseases of the spinal cord, and we have often witnessed under the influence of a douche at too low a temperature or too high a pressure, aggravations in the state of tabetic patients.

If, then, in certain cases of non-congestive medullary affections, in which the neuropathic state predominates rather than any sclerous alterations, clinicians have seen cold percutient douches give good results, it is better to recommend, for the truly tabetic, tepid, and even warm douches at a low pressure.

As for the internal treatment, it comprehends strychnine, ergot of rye, nitrate of silver, and phosphorus. Strychnine is the most dangerous medicament which we can employ in tabes dorsalis, and even in all diseases of the cord with lesions. By causing congestions of the cord, it augments the phlegmasic process, therefore it ought to be altogether discarded from the therapeutics of medullary affections. It was as a result of Brown-Séquard's labors that the medical profession came to employ ergot in affections of the spinal cord; the considerations on which are based the administration of this remedy are rather theoretical than practical, and I do not know that there exists a single observation where the employment of ergot of rye has given positively good results.

Vulpian and Charcot, in 1862, proposed nitrate of silver in the treatment of medullary affections, as Wunderlich had already done in 1861. This is a kind of treatment which is absolutely empirical, though still in use by Professor Charcot. I confess that

* The methyl chloride is applied on little wads of cotton (see *Semaine Médicale*, 1888, p. 35).—Tr.

† "Clinical Therapeutics," Detroit ed., chap. on "Hydrotherapy."

the results which I have obtained therefrom are more than doubtful, and the benefits which are derived from this treatment do not make amends for the gastric and intestinal irritation which follows the administration of this medicament.

I may say as much for the phosphorus treatment, which I myself proposed twenty years ago. I recommended at this time the administration of this drug to combat the medullary scleroses, and you will find in the thesis of my pupil, Dr. Eugène Lamaire, a report of most of the results obtained. Under the influence of phosphide of zinc or of phosphorated oil, ataxic patients seemed to have more force, more security in walking, less pain. But we must make all due account of the natural course of the disease, in which we see spontaneously supervening periods of calm and quiescence; and we must also recognize the influence exerted by phenomena of hypnotic suggestion, which always manifest themselves in affections of long evolution and whenever a new remedy is employed.

In connection with the consideration of the internal treatment, I ought to remind you of the advantages which have been claimed from antisyphilitic treatment in the ataxic. Professor Fournier, in showing us that the greater number of victims of tabes dorsalis are syphilitic, and in insisting on the preataxic phenomena which manifest themselves in advanced stages of syphilis, has given us hints which might seem to be of very great value in the treatment of tabes. But if clinical observation has confirmed the dictum of the professor of Saint-Louis, it must be admitted that few patients have been able to derive profit from this indication. While we, in fact, see syphilitic paraplegias greatly relieved, and even completely cured, under the influence of an intensive specific treatment, this is not the case with locomotor ataxia, and however rigorously you may carry out an antisyphilitic treatment, you obtain no beneficial result. The reason of this fact is easily understood. When the tabetic symptoms appear in syphilitic patients, the connective-tissue lesion has already been produced, and all kinds of treatment are powerless against this lesion. At the same time, it must be admitted that if medical interference is possible at the onset and at the preataxic periods, you will sometimes be fortunate enough—not to cure the patient, but to prevent the further progress of the disease.

I come now to the new therapeutic agencies. They pertain almost exclusively to the two following modes of treatment: 1, extension by suspension; and, 2, to the internal administration of the new antithermic analgesics.

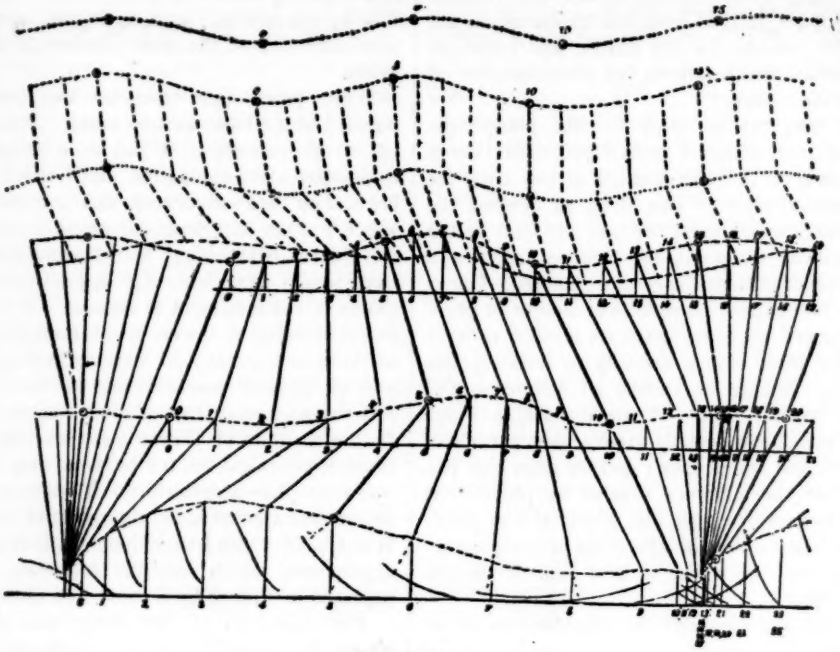
Many years ago extension was recommended in the treatment of tabes. To combat certain neuralgias, it had been proposed to practise nerve elongation, and Billroth and Nussbaum had advocated this method, to which Fornari had given the name of *neurecteny* (nerve-stretching); and I remember to have seen Verneuil in 1876 apply this elongation to the treatment of tetanus. It is sufficient to refer to the labors of Langenbuch, of Weiss in Germany, of Varnots in Belgium, and of Chauvel and Duvault in France, in order to appreciate the value of this method. In the memoir of Chauvel, out of fifty-two cases of neuralgia treated by stretching, there was a complete cure in thirty. Then this elongation was applied to the treatment of ataxia. It was in 1869 that Langenbuch made the first application, which was the following year repeated in France by Debove and Gillette.

The operation of stretching the sciatic nerves for tabes has been abandoned, and this for two reasons: First, on account of the short duration of the amelioration; second, because, as a sequel of these stretchings, there had been observed trophic disturbances of great gravity. This method comes back to us to-day under another form, that of suspension, and this time the results seem much more favorable.

When Dr. Raymond, after his visit to Russia, had made known in France the mode of treatment of Professor Motchoukowski, of Odessa, this method was at once put in practice at the Salpêtrière under the direction of Professor Charcot, and I have myself applied it to patients in my wards at the Cochin Hospital. Out of the twenty-five patients who have been subjected to this mode of suspension, we have obtained good results in the most of them, and in four a real improvement in the walking was observed. In order to estimate this improvement, we made use of the method of Marey. Quenu and Demény, aided by my pupil Burais, have cleverly given us photographic tracings, which will enable you to judge of this amelioration. (Figs. 1, 2, and 3.)

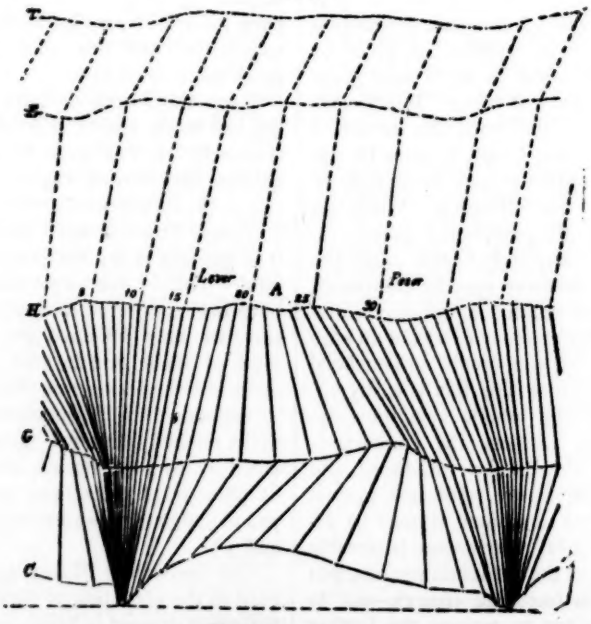
You know how Marey and Demény proceed in the obtention of these tracings. The patient is dressed in black, and walks in front of a black background; electric lights are placed at the head, the shoulder, the hip, the

FIG. 1.



Normal gait.

FIG. 2.



Gait of the ataxic before treatment.

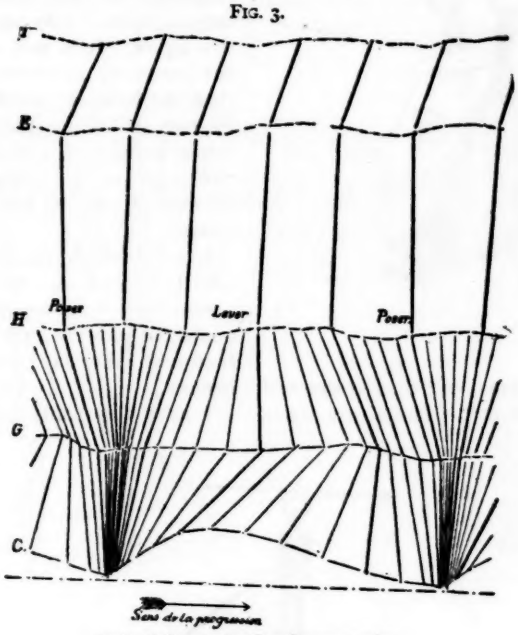
knee, and the tibio-tarsal articulation, and a photographic apparatus, which enables one to take proofs in fractions of a second, reproduces these luminous points, which only have to be united by lines in order to have a perfectly exact representation of the gait of the patient.

In comparing these different draughts with those obtained in patients whose gait is normal, we have noted an undoubted amelioration following suspension in four of our patients.

You can judge of this amelioration by the tracings given above. In Fig. 1 you have a representation of the normal gait; in Fig. 2 you have the gait of the patient before suspension; while Fig. 3 gives that of the patient after fifteen days of suspension, and you can judge of the benefit which has been derived from this mode of treatment, as far as walking is concerned.* For more particulars on this point I shall have to refer you to the communication made to the Academy of Sciences by Demény and Quenu, "On Locomotion in Locomotor Ataxia," which was read before the Academy, May 7, 1889, in which you will find an exposition of all that pertains to the peculiarities of the ataxic gait.

However, this improvement, which is especially apparent in the first fortnight of the treatment, soon ceases, and the patient's condition becomes stationary. Six of our patients have derived no benefit from the method; but, on the whole, the results have been sufficiently favorable to warrant us in continuing the practice of this method as occasion may indicate. I may add that we have never seen any serious harm result from it. At the same time, in the case of one of our patients, suspension, even of very short duration, produced fainting; in another, the pain was so severe that we were obliged to discontinue this mode of treatment.

Fig. 3.



Gait of the ataxic after the suspension.

Goreki has recently reported a case of death from suspension; in this case no physician was present. The patient was a paraplegic, who had caused himself to be suspended by his own domestic, and we are completely ignorant of how this suspension was accomplished.

Other cases of death have been mentioned in foreign journals; they were all the result of this fact, that the patients either suspended themselves, or caused themselves to be suspended by their attendants. Thus, Vincent, of New York, has mentioned the case of a patient who was strangled by reason of a

* In the figures, the capital letters T, E, H, G, C refer respectively to the head, shoulders, hips, knees, and ankles, which are the illuminating points. The words *lever* and *poser* are designed to indicate respectively the up-and-down movements of progression. The arrow shows the direction of the progression.—Tr.

giving way of the straps supporting the arms. Another physician of New York is said to

FIG. 4.

have fallen into a coma, and died at the end of twenty-four hours.* These are facts which it will not do to forget; they show clearly the danger which there is in leaving patients at liberty to treat themselves.

The *modus operandi* is very simple. Sayre's apparatus is the one used. The two figures here given show how this suspension apparatus is applied. (Figs. 4 and 5.) The patient is suspended at first thirty seconds, then for three minutes. I do not advise to go beyond this figure. It is well understood that it is not necessary absolutely to lift the patient from the floor; it is sufficient that the tips of the toes shall touch the floor. The face becomes congested, sometimes cyanosed, and you ought to be always ready to lessen the traction if the patient begins to be distressed.

It will never do to allow patients to undertake the suspension for themselves, as they always have a tendency to overdo it. Nor ought the physician to have recourse to this treatment every day; every other day is often enough.

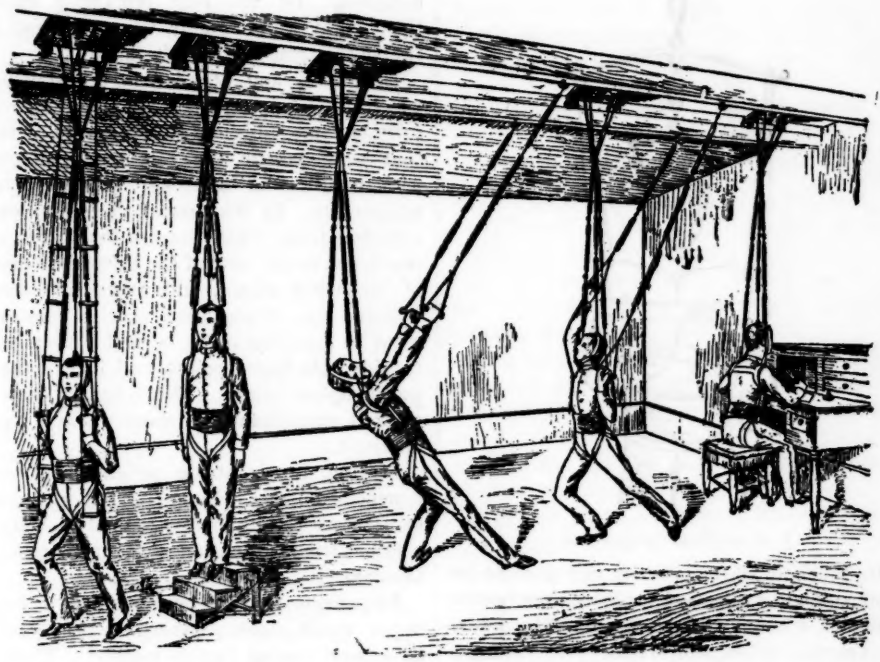
I have also made trials in my service of Pichery's method, in which suspension is combined with opposition-gymnastics. In the system of Pichery, an apparatus furnished with elastic cords and well-padded rings, which constitute the essential feature of

FIG. 5.

* *N. Y. Med. Journ.*, May 18, 1889.

this kind of gymnastics,* enables the ataxic patient to execute movements more or less co-ordinated of the upper and lower limbs, at the same time that he changes his position. The following figure will give you a general idea of this apparatus. (Fig. 6.) When the patient has executed these movements for ten minutes or a quarter of an hour, suspension is practised upon him.

FIG. 6.



In true tabetic patients this kind of gymnastics is not beneficial; it will not do, in fact, to forget that prolonged fatigue is always bad in these patients by reason of the medullary congestions which it entails. The ataxic expends considerable force in walking, and it will not do unduly to increase this expenditure by gymnastic practices.

On the contrary, Pichery's method should be employed in false ataxia,—*i.e.*, in all the disorders which arise in the course of functional neurataxia or hysteria; and in our hospital wards you can see a good example of this in a patient who, after being affected with hysterical paraplegia, has been effectually cured by these combined means.

Almost all experimenters who have repeated the experiments of Motchoukowski, have, like him, made use of Sayre's apparatus, or some modification thereof. At the same time, I ought to mention the clever modification devised by Dr. S. Weir Mitchell, and described in a recent number of the *Medical News*.†

Although the suspension is generally from the head and chin, you will see from the figure which I here show you (Fig. 7), that, ac-

* See the THERAPEUTIC GAZETTE, vol. for 1887, page 435.

† Dr. S. Weir Mitchell's method is described in the *Medical News*, April 13, 1889. The apparatus consists of two leather slings for the elbows; a band confines the arms to the waist. The patient is suspended partly by the head and partly by the elbows. To distribute the pressure upon the arms and trunk, the vertical straps are widened under each elbow to about four or five inches, and reinforced with leather. Sweeping round from the front to the back upright is a wide band, which comes against the outer aspect of the upper arm, yet leaving the point of the elbow free from contact. From one elbow leather to the other, and securely riveted to each, both across the front and back, pass stout straps, adjusted each by a buckle. Again, across the upper part of the chest, another strap, encircling the trunk, gives additional support.

The adjustment of the head is effected by a double pulley, or by a simple mechanism, thus: To the ring of each cheek-piece is attached a stout cord, which passes over a hook dependent from the large metal cross-bar, and thence by a strap inserted in a buckle made fast to the rear-elbow leather, one on each side. These hooks are about fourteen inches apart. With this mechanism the patient can be raised from the ground by the elbows, and then it is easy to adjust the amount of pull needed for his head.—TR.

cording to this process, the suspension is made in two periods. In the first the patient is suspended by straps passing under the elbows, and in the second by tractions on the head.

FIG. 7.

S. Weir Mitchell's apparatus.

Dr. Mitchell affirms that by this process he can maintain suspension for more than twenty minutes without inconvenience. Moreover, this method is less painful than other methods, from the fact that compression of the vessels and nerves of the axillary space is avoided.

Our patients have always, as a rule, borne suspension well; in almost all it has produced a sensation of heat and of congestion about the loins and lower extremities. In some of them, however, suspension has been so painful that we have been obliged to discontinue this mode of treatment.

This leads me to speak of the contra-indications for suspension. In general, all patients who are very feeble, whatever may be the cause of their enfeeblement, are poor subjects for this treatment. This contra-indication becomes absolute when you have to do with arterio-sclerosis and organic heart-disease. There is reason, in fact, to fear that the method of Motchoukowski may produce ruptures of blood-vessels and hemorrhages that will compromise the life of the patient, and Bloch has placed much emphasis on facts of this kind which have been witnessed.*

What are the results which suspension has given? From January 15, 1889, when Charcot made known the results of his treatment by suspension, to the 15th of last March, he reckons one hundred and fourteen cases of suspension, three of which were women; sixty-four of these cases should be reckoned out, as the observations were not sufficiently complete. Of the fifty remaining cases, thirty-eight were notably improved, and in twelve the treatment utterly failed.

Eulenburg and Mendel, in the statistics which they have published, show that in forty patients subjected to suspension, thirty-four were tabetic, the rest being affected with multilocular sclerosis, with paralysis agitans, etc. In the case of those who were suffering from other diseases than tabes, no result was noted; and of the thirty-four cases of locomotor ataxia, only twenty-one were followed up. These gave notable improvement in four instances, in twelve there was considerable improvement, and in five there was complete failure. These figures have a marked resemblance to those which I have obtained.

Morton, in six ataxic patients, has seen beneficial effects. Hammond has witnessed satisfactory results in five patients. Dana,† who has tried suspension in six cases, reports favorably.‡

Suspension has not been applied to locomotor ataxia alone. Other nervous diseases have been treated by this method. Thus, it has been tried in cases of spasmodic paralysis, of paralysis agitans, of Friedreich's disease, of transverse myelitis, etc. In some, suspension has given favorable results, in others none. One of the most remarkable instances which I have seen was obtained by my colleague, Chauffard, on one of my old patients whom I had sent to an infirmary. This boy was affected with convulsive tabes and spinal epilepsy; he was

* Bloch, *Bulletin Médical*, June, 1889, p. 728.

† *New York Medical Record*, April 13, 1889.

‡ *Treatment of Tabes by Suspension.*—Bernhardt (*Deustch. Med. Wochenschr.*, 1889, No. 21) has, during the last quarter of a year, treated nineteen patients, with about two hundred and twenty suspensions. Most of these were tabetic patients, some of whom had received more than twenty suspensions, others between fifteen and twenty. By all, even the very ataxic, the treatment was well borne. Apart from the beneficial psychic effect on the patient of a new method of treatment, there was an indubitable improvement in nearly every case. Some, it is true, stated that they felt no better, but in the majority Bernhardt recorded amelioration of the lancinating pains, increased ability to walk, diminution of the ataxia, increased vesical power, in some cases a decided influence on the lost sexual power, and in nearly all an improvement in the general condition.—TR.

unable to walk, and suffered horrible pains in his limbs. He has been to see me recently; the most of his symptoms have disappeared, and to-day he is practically well.

How does suspension act? The only explanation which can be given is that it acts as a process of stretching, the lower limbs making counterpoise to the traction exercised on the upper part of the cord by the suspension. In this sort of elongation, it is chiefly upon the posterior part of the cord, and on the vessels which supply it, that the stretching is exercised. This brings about a modification in the nutrition of the cord, and, in particular, in that of the posterior columns. Thus may be explained the amelioration which is obtained in systematized sclerosis of the posterior columns.

If this explanation is the true one, and if really the suspension acts by the elongation which it produces, it seems to me that we ought to modify this empirical method, and give it a more scientific character, for in the operation we are utterly ignorant of what traction we effect upon the cord, and, according to the height of the individual, his degree of stoutness and his weight, this traction must be more or less great. It would be desirable, then, to measure by the dynamometer both the traction which is produced on the upper part and that which is made on the lower part of the cord; and we might thus appropriate to therapeutic ends the method of torture which the ancient engravings have handed down to us, where we see the miserable wretches suspended with heavy weights at their feet.

We might thus, by attaching the feet of the ataxic patient to a dynamometer fixed to the ground, and by connecting another dynamometer with Sayre's apparatus, estimate what traction is effected on the extremities of the body. Hammond has already fulfilled one of these indications by applying the balance to the study of suspension, and in the beginning of the treatment he employs a weight of seventy to one hundred pounds.

To sum up, then, I believe that we are warranted in the conclusion that if suspension is not a curative method in ataxia, it is a method which relieves a certain number of patients, and may even bring about a notable improvement in walking in some of them, and, in certain extremely rare cases, may effect a relative cure; it is, then, a method which deserves to be kept in use, and this especially by reason of its harmlessness. In the next lecture I shall examine the benefits which have been realized in the treatment of ataxia by the employment of the antithermic analgesics.

THE PHYSIOLOGICAL ACTION AND THERAPEUTICAL VALUE OF APOCYNUM CANNABINUM.

BEING A THESIS READ FOR THE DEGREE OF M.B. IN THE UNIVERSITY OF CAMBRIDGE, ENGLAND.

By George R. Murray, B.A., M.B., Cant.; M.R.C.S., L.R.C.P., Lond.*

APOCYNUM CANNABINUM, Canadian or American Indian hemp, though not officinal in England, is placed in the United States Pharmacopœia.

It is a perennial plant, which grows in fields and near the edge of woods in many parts of the United States.

The root, in which lie the medicinal properties of the plant, is horizontal, slightly branched, several feet in length, and a quarter and half an inch in thickness. It breaks with a short fracture, and has no smell, but the taste is bitter and disagreeable.

Analyses of this root were made as long ago as 1833 by Drs. Knapp and Griscom, who found that it contained gallic acid, tannin, starch, gum, wax, and resin. They failed, however, to isolate any active principle.

In 1879, J. N. Lloyd, after allowing a fluid extract of the root to stand, obtained crystals of cane-sugar and a precipitate of white, waxy matter.

Schmiedeberg, in 1883, isolated two active principles,—apocynin and apocynein,—similar in their properties to digitalin.

This drug has been used considerably in America, where it was said to be a powerful diuretic in cases of dropsy, and especially in renal dropsy. It has many other properties attributed to it; thus, it acts also as an emetic and purgative, and is said to act as a diaphoretic, when it produces vomiting. It promotes expectoration, causes drowsiness, increases the flow of urine, diminishes the force and frequency of the pulse. It is said to be tonic and alterative, and is even accredited with the power of destroying intestinal worms and curing mild cases of intermittent fever. Stillé and Maisch, who mention these various properties of the drug, consider that "probably it is a mere evacuant of dropsical effusions. . . . There can be little doubt of its

* Late House Physician University College Hospital.

possessing this value in common with jalap and other hydragogue cathartics."

Dr. Lewis published in the THERAPEUTIC GAZETTE seven cases of pleurisy with effusion which were treated with apocynum. In all these cases the fluid subsided rather quickly when the apocynum was given. In cases of this kind the effusion so often disappears rapidly when no special treatment is adopted, that it becomes very difficult to estimate how much of the improvement is really due to the drug. I have not seen any such cases treated with apocynum, and so have no personal experience of its action on pleuritic effusion to record.

Dr. J. S. Dabney maintains that apocynum is one of the best diuretics and hydragogue cathartics that can be employed in Bright's disease, as it not only causes marked diminution in the anasarca, but also lessens the amount of albumen and casts in the urine. The special advantages he claims for it are—

1. A small quantity only is necessary to produce diuresis, emesis, or catharsis.
2. It has an agreeable aromatic taste.
3. It has tonic properties.
4. Its harmlessness, from emesis resulting from an overdose.

Dr. Ringer tells me that a few years ago he tried apocynum as a diuretic in Bright's disease, but found that it did no good. In one case of acute Bright's disease, which I watched carefully, tincture of apocynum, given in 10-minim doses four times a day for nearly a fortnight, caused no definite increase in the quantity of urine passed, and did not improve the condition of the patient at all.

Another patient, with chronic Bright's disease and cirrhosis of the liver, with ascites, took 20-minim doses of tincture of apocynum four times a day for several weeks. It did not increase his urine nor diminish the albumen, and his abdomen had to be tapped once or twice during the time he was taking the medicine. He maintained, however, that it did him good. This relief probably was due to the fact that the apocynum produced two or three rather loose stools each day. Any other purgative might have done the same.

It may be mentioned here that in neither of these cases, in both of which the heart was healthy, did the apocynum cause slowing of the pulse.

So far, then, as our experience goes in this country, apocynum does not act as a diuretic in the class of cases of dropsy in which American authors found it useful.

Some experiments have recently been made by Dr. J. Rose Bradford to ascertain the physiological action of apocynum. He has most kindly allowed me to quote some of the results he has obtained from his experiments on animals. In two of these experiments he used a tincture of the root, 1 in 10 of proof spirit. The same preparation was used in the treatment of the cases quoted.

Dr. Bradford finds that the principal action of apocynum is on the heart. The heart of a dog is slowed down to a very remarkable degree, for when it is well under the influence of this drug it beats as slowly as two beats to each respiration, or even three beats to every two respirations. This is a much more powerful effect than can be produced experimentally with digitalis. For before this amount of slowing is reached, the vagus becomes paralyzed, and the heart beats more rapidly and irregularly.

Apocynum strengthens the heart's beat and increases the tonus, so that it stops the frog's heart in systole. It generally stops the mammalian heart in diastole, but a sudden massive dose may stop the mammalian heart in systole. It may further be noticed here that clinically we find that it regulates the action of an irregular heart.

From this it is evident that the action of this drug on the heart is similar to that of digitalis, strophanthus, adonidin, caffeine, and sparteine, only its power of slowing the heart seems to be greater than in the other members of this group. Its action on the arteries, as shown by changes in blood-pressure, differs from that of digitalis. For Dr. Bradford finds that apocynum causes no definite rise of blood-pressure, indicating that it does not cause contraction of the arteries.

In its physiological action, as a whole, on the vascular system it resembles strophanthus more closely than digitalis, for it acts in a similar way to strophanthus on the heart, and, like it, does not cause contraction of the arteries.

Having thus briefly described the physiological action of apocynum, as shown by experiment, it will be well to consider theoretically the kind of case in which it may be expected to do good, and then to give such practical illustrations from some cases which were treated with it in University College Hospital. These cases, as well as those already mentioned, were all under the care of Dr. Ringer, who has most kindly allowed me to make use of them for this paper.

We will consider first its action on the heart alone.

From the similarity of its action to that of digitalis, we expected that it would be useful in cases of mitral disease.

In cases of mitral regurgitation, the backward flow of the blood through the mitral orifice may be due to four different conditions, which may occur singly or in various combinations.

If the mitral valves are shrunken and retracted by disease, they are no longer large enough to close the mitral orifice, and so the blood flows back into the auricle during the ventricular systole. In this case no drug can alter the condition of the valves themselves and prevent regurgitation.

When the left auricle and ventricle are weak and dilated, the auriculo-ventricular orifice is also enlarged. Under such circumstances even healthy valves would be unable to meet properly; if they are also retracted, a still greater amount of regurgitation takes place. Now, apocynum increases the tonus of the heart, and in this way lessens the size of its cavities. The mitral orifice is thus made smaller, so that the valves, if competent, are able to close the opening, or even, if incompetent, can lessen the amount of regurgitation to a considerable degree.

It has been shown by Professor MacAlister that the closure of the mitral valves is due in part to the efficient contraction of the left ventricle, consequently regurgitation may be due to incomplete contraction of a ventricle, with quite normal valves. If the valves are smaller than in health, the regurgitation is necessarily aggravated.

We have seen that apocynum increases the amount of contraction of the ventricle. By doing this it remedies any regurgitation which is due to imperfect contraction of the ventricle.

Dr. Ringer has suggested yet another way in which regurgitation may be produced. In mitral disease there is frequently irregularity of the heart, in consequence of which the papillary muscles do not act in concert with the walls of the ventricle, but pull back the valves at the wrong time, and thus allow regurgitation to take place. If the valves are insufficient, this inco-ordination must cause a further increase in the reflux of blood. This view is still further borne out by Dr. Brunton's observations. In cases of poisoning by digitalis, the heart becomes at last rapid and irregular. The irregularity is accompanied by a loud systolic murmur in horses, dogs, and man, which, he says, is most probably due to mitral or tricuspid regurgitation caused by irregular contractions of the columnæ carneæ.

Apocynum can obviate the regurgitation produced in this way by regulating and co-ordinating the action of the heart.

In any given case of mitral insufficiency, apocynum may be expected to remedy as much of the regurgitation as is due to any of the last three of the four cases mentioned.

The following case illustrates many of these points, and shows the rapid and efficient action of apocynum.

C. G., a woman of 58, was admitted to University College Hospital on January 1, 1889, complaining of "dropsy and heart-disease." She had been under treatment in the hospital two or three times before for the same conditions, and had greatly improved each time under digitalis, aided on one occasion by malleolar incisions.

PRESENT STATE ON ADMISSION.

General.—The patient is a stout woman of 58. She lies propped up in bed by pillows, as she can breathe more freely in that position.

The lips, cheeks, and ears are cyanosed, and the conjunctivæ are slightly jaundiced.

The feet and legs are swollen and œdematous.

The abdomen is enlarged, and measures forty-seven inches in circumference.

Circulatory System.—Symptoms.—Shortness of breath, and swelling of abdomen and legs.

Physical Examination.—Inspection.—There is slight bulging of the cardiac area, and all over it strong, heaving pulsation is visible, irregular in force and rhythm.

Palpation.—A fairly strong impulse is felt all over the cardiac area. The heart's apex beat can be felt in the fifth intercostal space four inches to the left of the middle line. The impulse given by the right side of the heart is strong and rather heaving in character. That given by the left side is shorter and less powerful. No thrill can be felt.

Auscultation.—At the apex both sounds of the heart are audible, and there is a loud, blowing, systolic murmur, which is conducted out into the axilla. No other murmur is heard, so that the mitral regurgitant murmur is the only one present.

Arteries.—The radial pulse is 130, irregular in force and rhythm, and low in tension.

Digestive System.—Appetite fairly good, bowels regular, tongue clean, but she complains of thirst and flatulence.

The abdomen is considerably distended, measuring forty-seven inches in circumference. The abdominal wall is tense and œdematous, and a distinct thrill is felt on tapping.

The lower edge of the liver can be distinctly felt four inches below the margin of the ribs.

The abdomen is resonant to percussion in front, but there is dulness in both flanks, which is diminished on the one side when the patient rolls over on to the other.

The urine is normal in character, and she passes sixteen to twenty-eight ounces in the twenty-four hours.

We thus have a fair typical case of mitral regurgitation, with a considerable amount of dropsy of the abdomen and legs, a weak, irregular pulse of low tension, and rather scanty urine.

On admission to the hospital on January 1 in this condition, she was put to bed and kept quiet. After she had been in the hospital for twenty-four hours she did not show any improvement from rest alone, as she had been kept in bed at home previously. She was then put on 5-minim doses of the tincture of apocynum every four hours. During that day (January 2) the pulse remained frequent, being 126 in the morning and 130 at night, and it maintained the same characters. She passed twenty-eight ounces of urine.

On January 3 the pulse fell in frequency to 102 in the morning and 114 at night, became less irregular, and there was more tension in it.

The quantity of urine increased to one hundred and three ounces for the twenty-four hours.

The dose of apocynum was doubled.

On January 4 the pulse had fallen to 96, the irregularity had still diminished, and the tension had increased.

The abdomen was less distended, and the cyanosis much less marked.

The urine was increased to one hundred and forty-seven ounces.

January 5.—The pulse was 94 in the morning and 86 at night. Only a slight amount of irregularity could be detected, and the tension was still further improved.

One hundred and seventy-nine ounces of urine were passed.

The patient was very sleepy during the day, and complained of nausea, so the 10-minim dose of apocynum was given four times a day instead of every four hours.

January 6.—The pulse was rather more frequent again, and varied between 90 in the morning and 106 at night, but maintained its good tension, and was only slightly irregular.

One hundred and twenty-seven ounces of urine were passed.

The nausea had gone, the ascites had diminished considerably, and the œdema of the feet and legs was less.

The apocynum was reduced to three times a day.

During the 7th, 8th, 9th, and 10th of January the pulse varied between 80 and 90, and one day went up to 100. The quantity of urine fell to thirty to fifty ounces of each day, this fall being doubtless due to the fact that nearly all the dropsical fluid had been run off, as during the preceding four days nearly twenty-eight pints of urine had been passed.

On the 9th the pulse was regular.

On the 10th she got up.

January 11.—The pulse was 80, rather irregular, but the tension was good.

During the 11th, 12th, and 13th the daily quantity of urine varied between thirty-one and forty-one ounces, and the pulse remained about 80.

On the 12th the medicine was given twice.

On the 13th once.

On the 14th the medicine was discontinued. The pulse was 81 in the morning 90 at night, the tension high, and scarcely any irregularity could be detected.

January 16.—Pulse 90; irregularity more marked than during the two preceding days. Twenty-six ounces of urine were passed. She was again put on 10-minim doses of apocynum three times a day.

During the 18th, 19th, and 20th the pulse varied between 82 and 92, only occasional irregularity could be detected, and the tension was high. Patient got up each day and walked about the ward. There was no nausea or purging.

This improvement was maintained till she left the hospital on the 24th.

The action of the drug on the pulse and flow of urine is best shown by placing them side by side in a table.

TABLE OF PULSE AND FLOW OF URINE.

Date.	Pulse. Morning.	Pulse. Night.	Ounces of urine for twenty-four hours.	Medicine.
January 1.....	.....	128	16	
January 2.....	126	130	28	Tinct. apocyni, ℥v, every four hours.
January 3.....	102	114	103	Tinct. apocyni, ℥x, every four hours.
January 4.....	96	96	147	" "

Date.	Pulse. Morning.	Pulse. Night.	Ounces of urine for twenty-four hours.	Medicine.
January 5.....	94	86	179	Tinct. apocyni, ℥x, four times a day.
January 6.....	90	100	127	Tinct. apocyni, ℥x, three times a day.
January 7.....	88	88	47	" "
January 8.....	82	...	49	" "
January 9.....	81	...	30	" "
January 10.....	96	100	50	" "
January 11.....	80	...	41	" "
January 12.....	78	...	31	Tinct. apocyni, ℥x, twice a day.
January 13.....	...	...	41	Tinct. apocyni, ℥x, once a day.
January 14.....	81	90	14	Medicine stopped.
January 15.....	84	100	26	
January 16.....	90	92	36	Tinct. apocyni, ℥x, three times daily.
January 17.....	84	92	20	" "
January 18.....	82	88	19	" "
January 19.....	88	92	8	" "
January 20.....	84	...	18	" "
January 21.....	90	...	...	" "
January 22.....	84	90	...	" "
January 23.....	94	...	...	" "
January 24.....	...	...	...	" "

On reviewing this case, even one who has no great faith in the efficacy of drugs, must admit that apocynum had a rapid and unmistakably beneficial effect. The slowing action on the heart is shown by the fall of the pulse from 126 to 102 during the first twenty-four hours of the administration of the drug, and by its subsequent fall to between 80 and 90.

Its regulating action on the heart is shown by the rapid diminution in the irregularity of the pulse.

Its power in improving the strength of the heart's beat is shown by the increased size and strength of the pulse.

Its effect in improving the circulation as a whole is shown by the removal of the cyanosis and the rapid running off of the dropsical fluid by the kidneys.

It is also worthy of note that the diuresis began as soon as the improvement in the circulation became evident by the slowing and regulating of the pulse.

The rapidity of its action is shown by the slowing of the pulse to the extent of 24 beats, and the increase in the quantity of urine for the twenty-four hours from twenty-eight ounces to one hundred and three ounces during the first twenty-four hours of the exhibition of the drug.

The only effect produced on the digestive system was nausea on January 5, when she was taking 10-minim doses every four hours. This disappeared as soon as the number of doses was diminished.

We may next consider how apocynum may do good in cases of mitral constriction.

In the normal heart the auricle empties its contents into the ventricle during the ventricular diastole.

In mitral constriction the auricle is unable to empty itself through the narrowed auriculo-ventricular orifice in the same time, and so it becomes overdistended and thereby weakened. For it is a hydrostatic law that the pressure necessary to drive out the fluid contents of a hollow sphere is equal to the resistance to be overcome multiplied by the radius of the cavity. Both the latter factors are increased in mitral constriction, the resistance to be overcome is increased, and the mean radius of the cavity is made larger by the overdistention of the auricle. So the greater the distention of the auricle, or the narrower the mitral orifice, the greater the force required to empty the auricle.

Under these conditions apocynum can act in three ways.

It lengthens the diastole of the ventricle by slowing the heart; this necessarily gives the auricle more time to empty itself through the narrowed orifice.

By strengthening the auricular contraction it gives it more power to propel the blood onward into the ventricle.

The tonus of the auricle is increased, and its cavity is thus diminished in size. The auricle can then only contain a smaller quantity of blood, and has less to drive through the obstruction each time it contracts, the weakening due to overdistention being thus obviated.

In any given case these modes of action probably all come into play, but they are more easily understood if taken thus separately.

The following case of pure mitral constriction, which was treated with strophanthus, digitalis, and apocynum in turn, illustrate the action of the latter.

A. C., a girl of 21, was first admitted to University College Hospital on September 24, 1888, with shortness of breath, cyanosis, and clubbing of the finger ends.

On physical examination there was found a well-marked præsystolic thrill, running up to a strong cardiac impulse.

In auscultation a long, loud, præsystolic murmur was heard. The liver was enlarged, and she was occasionally jaundiced. She had a hard cough, with difficult expectoration of glairy mucus. Fine râles were audible over the lower part of the lungs behind. The pulse was regular, but varied between 100 and 120.

She took 10-minim doses of tincture of

strophanthus three times a day for about a week, but this did not slow her pulse, nor did it relieve her. She was then given digitalis. She improved most on doses of the latter, which were sufficient to slow the pulse down to about 80, the improvement being coincident with the slowing of the pulse. To do this it required 10 minims of the tincture six times a day.

On November 19 she left the hospital for six weeks. She returned on December 15 in much the same condition as on her first admission in September. Her pulse was 120.

She was put on tincture of digitalis, 10 minims, four times a day.

On December 19 this was increased to 15 minims four times a day.

On the 20th the pulse had fallen to 88, and the cough and dyspnœa were much less marked.

On the 26th the digitalis had to be discontinued on account of the vomiting it produced. After this the pulse did not exceed 100 till January 14, when it reached 114, but no special cardiac remedy was given till January 17, when the pulse was 120, and she was put on 10-minim doses of tincture of apocynum four times a day.

On the 18th the pulse was 96, she felt better, her cough had gone, and the jaundice, which had been present for the four preceding days, was less.

On the 19th the pulse was 80 to 90.

On the 20th the patient was much better; the cyanosis was considerably less; the jaundice also was diminished; pulse, 74: no vomiting or purging.

Next day patient left the hospital.

In this case the decided improvement which occurred when the pulse was slowed by digitalis came also when it was slowed by apocynum, showing the similarity in the therapeutical action of the two drugs on the heart.

The rapidity of its action is shown by the slowing of the pulse from 120 to 96 in the first twenty-four hours, and from 96 to between 80 and 90 in the next twenty-four, and to 74 on the third day.

The strophanthus caused no appreciable slowing in the pulse, and the digitalis had been taken for ten days, on the first occasion, and for four or five on the second, before it caused distinct slowing. No unpleasant effect was produced on the digestive system by the apocynum.

We may now consider lesions of the aortic valves.

In aortic obstruction, when there is efficient compensation, no medicine is required. If there is fatty or fibroid degeneration, apocynum could have no effect on the degenerated cardiac tissue. It would cause the remaining weak cardiac muscle to contract with more energy than it was able to maintain, and so in reality hasten its final failure. In cases where the heart substance is not degenerated, but the compensation is not complete, apocynum might do good in strengthening the beat. If, however, we can reason from what we know to be the effect of digitalis, and presumably also apocynum, on the right ventricle, under somewhat similar conditions, we should not expect it to be of much use.

In a case of emphysema the right ventricle has a certain abnormal amount of obstruction to overcome in driving the blood through the emphysematous lungs.

We will consider a case in which its reserve power enables it to fulfil its task properly.

If such a case has an acute attack of bronchitis, the obstruction in the lungs is greatly increased. All the reserve power of the right heart has already been called into play in overcoming the pre-existing obstruction. It is unable to overcome the increased resistance in the lung, and so becomes overdistended and weakened. Under such circumstances we should expect on theoretical grounds that apocynum would do good by strengthening the beat of the right ventricle and enabling it to overcome the obstruction. Clinically, we find that digitalis does not do good in this kind of case, nor probably would apocynum, though I have not tested it. This being the case, we must not expect much benefit from it in cases of aortic obstruction.

In aortic regurgitation, apocynum, by lengthening the diastole, would allow a longer time for the blood to flow back into the left ventricle, and thus increase the mischief. Its action in this direction would not be so great as that of digitalis, for it does not raise the blood-pressure, a factor which, in the case of digitalis, must tend to increase the regurgitation still further.

We must, on the other hand, remember that so great an authority as Dr. Balfour holds that digitalis in large doses is of great service in aortic regurgitation with deficient compensation, as it lessens the cavity of the ventricle by increasing the tonicity of its walls, thereby preventing dilatation.

If this be the case, apocynum may be able to do good in the same way.

In fevers, where the pulse is frequent and the heart is becoming exhausted by its rapid action, drugs which slow the heart, and especially digitalis, have been found to act beneficially. They lengthen the diastole, which is the natural resting time of the heart.

We may, I think, hope to find apocynum useful for this purpose on account of its very powerful slowing action.

I have notes of only one case in which it was given with this object in view.

It was a case of phthisis, with tubercular ulceration of the intestines, with a temperature which rose each evening to 102° F. or 103° F., and a rapid, feeble pulse, varying between 120 and 140.

On January 15, the pulse being 140, she was given 10 minims of tincture of apocynum three times a day.

On the 16th the pulse was 132 in the morning and 116 at night; was less compressible and fuller during diastole than on the preceding day.

On the 17th the pulse was 120 in the morning and 108 at night, and the improvement in tension was maintained. The dose was then doubled. This, however, increased the patient's diarrhœa, and so the medicine was discontinued.

In this case there was a little slowing of the pulse, but the treatment was not continued long enough to enable one to judge of its effects, and the case was an unfavorable one for trial, owing to the tendency to diarrhœa.

The purgative action of the drug would be unfavorable to its use in cases of typhoid fever with diarrhœa.

As to the action on the kidney, we have seen that in our experience apocynum is useless as a diuretic in case of dropsy due to Bright's disease.

The case of mitral regurgitation, given at length above, was a good illustration of its powerful action as a diuretic in cardiac dropsy. Now, we know that digitalis acts as a diuretic, mainly by improving the circulation and removing the causes which lead to the accumulation of dropsy, for it does not cause much diuresis when there is no dropsy.

We may consider, then, that apocynum acts chiefly in a similar way through the heart, and not as a local renal diuretic. This view is strongly supported by the evidence that its chief use as a diuretic is in cardiac dropsy; and, further, that the diuresis ceases as soon as the dropsy has all been run off, as in the case related above.

In the above description of the therapeutical action of apocynum, I have not described all the cases in which it was given. The total number of cases was small, and, I am fully aware that experience derived from only a few cases does not go for much in estimating the true value of a new drug which is on trial. I have, therefore, only related such cases as appeared most directly to illustrate the positive action of the medicine.

The chief drawback to apocynum is the effect it has on the digestive system in some cases.

In two cases it excited persistent vomiting, so that it had to be discontinued.

In two other cases it caused vomiting, but this passed off, though the medicine was continued.

In one case it aggravated the diarrhœa to which the patient was subject, and so had to be discontinued.

The history of most valuable medicines shows us that it often takes years for a new drug to find its own level as a therapeutical agent. A proper estimate of its true value can only be found by the analysis of a number of carefully reported cases of varying types and occurring under various conditions.

At present we cannot say what the true therapeutical value of apocynum may be, but I think that the above cases show that in it we have, at any rate, a powerful cardiac remedy. Whether it will in the long run prove superior to other members of the same group of medicines or not I am not as yet in a position to foretell.

In conclusion, it is my pleasing duty to express my best thanks to Dr. Ringer for allowing me to publish his cases, and also for much valuable advice for this paper, and to Dr. Bradford, who has so kindly allowed me to quote his unpublished experiments.

NEWCASTLE-ON-TYNE.

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*SULPHONAL.**

BY HENRY M. FIELD, M.D., NEWTON, MASS.†

AT once upon my return from medical lectures last year,—mid-October, 1888,—I was attracted to various clinical reports respecting the use, value, and safety of the

* Read before Sections of the New Hampshire and Vermont Medical Societies, at Dartmouth College, August 2.

† Professor of Therapeutics, etc.

new hypnotic sulphonal, presented by the last number or two of the THERAPEUTIC GAZETTE, which the mail had brought during my absence. And just here I would freely acknowledge the claim which this enterprising periodical has both upon my gratitude and my respect; from this source was the new and invaluable material first brought to my notice, and in its pages has been maintained up to the present what I believe to be the only correct spelling of its name.* Too hesitant as I may confess myself generally to be to prescribe a new drug, I found myself very strongly impressed by the arguments and representations adduced in support of sulphonal; and availed myself of the first opportunity offered to try its action. The venture was repeated again and again, to such extent that I was already in position to form some opinion of the merits of the new hypnotic before several of my most active neighbors in the profession had realized its existence. To-day, with a ten-months' record of nearly two hundred carefully-observed applications,—*i.e*, in as many different subjects,—given for longer or shorter periods, to "all sorts and conditions of men," I am prepared to claim that sulphonal "*has come to stay*," and to prove—at least this shall be my effort in the pages which follow—that *it has already asserted its right to stand first in the class of hypnotics.*

Almost from the first I have *pushed* sulphonal. In my moderate family practice I could not otherwise have had so wide an experience in its use. Moreover, I myself have tried the soporific probably as many as thirty times.

I repeat that I have rather pushed the remedy, and this for several reasons. 1. Some form or degree of insomnia is a frequent condition among my patients, consisting, as they do, chiefly of overburdened business-men and their no less burdened wives. 2. I was early impressed with the belief, and later was convinced, that sulphonal is as valuable, as indispensable an addition to our therapeutic resources as was chloral hydr. twenty years ago; and the latter, by way of comparison, is about as high a standard of medicinal value as could well be adduced, for, before we had chloral, the physician possessed no real hypnotic agent whatever. 3. With increased observation of its action came increased assurance of the credibility of the statements which accompanied the introduction of sulphonal,—viz., that when applied with fair intelligence the remedy is wholly safe. 4. With increased use, also, came increased confidence in adaptedness to purposes for which the drug was applied and satisfaction with its results. And, finally, corresponding to a gradually increasing demand for hypnotic interposition and relief which my clientele, for some time past, had seemed to present, had been a growing limitation in choice of hypnotic agents, and disappointment or vexation in their effects. In just such state of perplexity sulphonal came to hand.

As respects chloral, both physiological and therapeutic action had been generally good, but various disabilities attend its employment. An effective measure of dosage implies large bulk, demands free dilution, and insures a solution too often offensive to taste, especially with the young, and with the fastidious female. Its supposed tendency to depress the heart raises an unpleasant question in case of the adult and senescent subject. But worst of all, a popular prejudice, largely created and fostered by the secular press,† which knows nothing of that on which it presumes to pronounce judgment, has introduced a very serious obstacle to the use of chloral. In a medical experience of fully twenty-five years, I am prompt to say I have never known another drug-prejudice both so unreasonable and disastrous in consequences, and one so widely distributed, so strongly entrenched among the intelligent of the country, as that which has controlled for many years past in respect of chloral. I repeat, disastrous in consequences. Your patient has the utmost confidence in you, and has long been wont to obey your orders, but if you

* *Sulphonal* and not sulfonal. The latter is apothecaries' spelling, and foreign apothecaries' at that. It does not follow that we should accept a foreign method in orthography because we receive the material of corresponding name from a foreign source. We receive sulphonal from the chemist also; but not the name he gives it,—*diethylsulphon-dimethyl-methane.* All our language analogies support the name which we assert.

† No better support could be presented of the two-fold statement concerning source of prejudice, and also ignorance as to matter discussed, than the following: A few years since, a periodical devoted to the instruction and entertainment of the young,—we withhold the name,—which is probably more widely circulated throughout the whole country than any other publication which is not strictly a newspaper, the tone of which is usually elevated, conservative, and cautious, printed in its columns a violent diatribe against chloral, which the writer denominated, in equal disregard of truth and decency, "*liquid hell!*" The writer had, apparently, taken the remedy in solution, whence his deduction respecting its "liquid" constitution.

order chloral he is pretty sure to know it (there is no plurality or choice of names in this instance, and *doctors' Latin* does not avail), and such discovery is little calculated, as repeated experience has shown, to assist the calmative and soporific influence of the sleeping potion exhibited. The remark of one patient will illustrate a common experience: "You were all right, doctor; it was the chloral that was wrong, or rather my knowledge that you gave me chloral. It made me sleepy, but I fought against it half the night *for fear if I once got asleep I should never wake up!*"

And, until sulphonal came, what other hypnotic had we but chloral? We used, twenty years ago, to call *opium* soporific, but it is quite as likely (indeed, it is more likely) to exert an excitant influence upon the brain and keep the patient awake but happy, while it puts him in worse trim than before for the work of the next day.* The *inorganic bromide*, of whatever base, is a feeble and rarely acting hypnotic, not an agent for general use and trust in this realm. *Urethan* might, practically, be defined as a feeble and nearly tasteless chloral, and of occasional activity in the infant subject. *Paraldehyde* has greater bulk in dose, greater offensiveness in taste, than chloral, while its therapeutic power is less pronounced and for less time maintained. So far as we may trust the often-repeated assertion that it does not depress the heart, it has one valid claim to our suffrages. But the patient who takes his chloral without complaint will too often "draw the line" at paraldehyde. To its offensive taste must be added the after-taste and the *after-breath* on the following morning, and which, in character and source, are allied to phenomena presented by the subject of too generous alcoholic potations. Finally, the dangers which attend an attempt to make the various *alcoholics* serve the *rôle* of soporific are too obvious for specification; while, none the less, from a therapeutic point of view, an alcoholic more justly belongs to the class of soporifics than does opium.

Therefore prompt welcome was given to sulphonal as to an agent which promised to afford relief in an exigency of much stress, many issues, and attended with much perplexity; and which, on further acquaintance, gave assurance that the welcome extended was not misapplied and still promised more and more. Thus far the percentage of failure in my application of the new drug has been very small,—exact figures are not at hand. In such small per cent., I later came to see, at times, that the fault was my own,—*i.e.*, there was faulty administration,—or, again, in a few instances, failure resulted from individual idiosyncrasy. If my success has been more frequent, my failure less frequent than that of many others who have published clinical reports; if my conclusions respecting the value of sulphonal should appear optimistic, as tried by the consensus of opinions expressed in various medical journals for the last eight to ten months, permit a suspension of judgment until I may present with emphasis what I hold to be *essential conditions of success* in the exhibition of this new and unfamiliar drug.

Such conditions may be rated as three in number. The first governs *the time* when the remedy should be administered; the second concerns *the method* of administration; the third determines *the dose*.

1. *The Time.*—It is a fact, perhaps wholly unprecedented in what we observe of other neurotic materials, that sulphonal demands from one to two hours, or, rather, better, it demands from two hours to one hour, for its physiological incubation; often quite two hours elapse between ingestion and the first accession of sensible medicinal energy. With the untried subject it is wise to stipulate for two hours. Again, as a minor consideration, although the drug does not disturb, and is not disturbed by, the processes of gastric digestion, it is well, on general principles, not to introduce it into the stomach when this organ is in a state of repletion and at the very height of functional activity. Both these points can easily be provided for. The patient who retires exceptionally early can place one hour at least between the close of his evening meal and the ingestion of his hypnotic, while nearly or quite two hours will remain before he goes to bed. But it is the latter point on which we insist,—the favorable influence of the remedy may wholly rest upon the condition,—that the patient does not get into bed, with expectation of sleep, until the sulphonal has begun to declare its action. Again and again, in my own early experience, it was made evident that the person who thus erred, through misdirection or inattention, would have been much better off if he had had no sulphonal whatever. This critical fact has not been properly set before

* Moreover, aside from such physiological impression, a vicious therapeutic influence often attends its application in insomnia. *Vide* note at conclusion of this paper.

the profession. Many who have published clinical reports upon the new hypnotic seem hardly to have apprehended it. It deserves the brief space devoted to its discussion.

The drug is confessedly directed for relief of insomnia. The patient, uninformed, looks for prompt action. Waiting for this, with no sign of its approach, he soon gets weary, then grows excited, perhaps sceptical. Much, presumably, was promised, but sleep still eludes him. One-quarter hour after another passes, and still no calm, no indication of sleep. In how many instances during the last winter might not such record, in effect, be applied to him who took his sulphonal as one should take chloral, either after getting into bed or immediately before! The brain rendered excitable through past experience with insomnia, the subject made incredulous, quite likely,—and this is a common complication,—through past failure of other resources, finds fresh provocation in this new miscarriage, and disappointment and vexation aggravate excitement, so that by the time the firm but gentle sulphonal influence is—or should have been—developed, the patient is in no condition to recognize or yield to it. Sleep comes at last, for the sulphonal will demand its own, but quite probably not until after midnight. The impression, once declared, gains new momentum every hour. Its acme is reached in the morning hours, when approaches the time for arising. The drug was taken for sleeplessness, not for sickness. Business engagements press, sleep is shaken off, from which it is positive pain to be aroused, the victim continues dazed, lethargic, sleepy, through half the day, and sums up his experience with the conclusion that the new soporific is the most "pestilent" drug he had ever encountered. And yet, with the rare exceptions to be presented later, the kindly hypnotic was in nowise at fault; the doctor was responsible both for failure and for subsequent suffering.*

It is true that now and then the soporific impulse is realized much sooner than was calculated. A lawyer, under observation, has assured me that repeatedly a 10-grain powder brought drowsiness in fifteen to twenty minutes; this is the briefest period ever reported to me. Such exceptional subjects can be instructed in terms proper to their idiosyncrasy. Yet if this peculiarity be not at once noted, little discomfort results, for the sulphonal soporific influence grows in power as the hours advance, and its early impression has little of the overwhelming force which characterizes the first assault of either opium or chloral.

The second condition is relatively of light weight. Viewed out of present connection it has high importance. Experience establishes the position that sulphonal is best dispensed in *finely-divided powder*,—*i.e.*, the crystals, as sold in the shops, should be rubbed up in the mortar before the prescription is passed to the patient. The recipe should always call for *pulverized* sulphonal. More than once has a patient been choked by the sharp-edged, semi-amorphous, semi-crystalline plates which the chemist sends forth from his laboratory, and even vomiting has followed from a strictly mechanical irritation. But, of all pharmaceutical modifications, the lozenge or tablet, whether of fifteen, ten, or five grains weight, should be avoided. Practically tasteless though it be, such mass requires considerable grinding between the teeth; the harsh, gritty feel is unpleasant; it is quickly swallowed after division into a few fragments; and sulphonal thus presented to the stomach is not likely to obtain ready and complete entrance into the circulation. How it ever enters the circulation under most favorable conditions is problematical, being, as it is, soluble by only one per cent. in water, having the power to resist both alkalies and concentrated acids; but that sulphonal in solid mass exerts uncertain and diminished energy cannot be open to doubt. More than once I have known a tablet of fifteen grains show less power than five to seven grains in fine powder. Sulphonal is far too costly to warrant such waste as this.

How shall sulphonal powder be administered to the patient? The latter is greatly liable to go wrong in this matter unless instructed, and the physician is far too liable to withhold information. The cachet or wafer serves well for a dose somewhat below ten grains; the usual dose (10 to 20 grains) is best taken from the bowl of a spoon into the mouth, or allowed to roll upon the tongue from a scroll of sized paper; a free draught of water to be taken at once thereafter. If the spoon be dipped in water before it re-

* *Sulphonal demands its own.* A strange quality, which seems to be inherent in this material. In its wise application and its usual action, the dose, which was calculated to provide eight hours' sleep, will be completely slept off in such period. If sleep be abbreviated or interrupted, the patient, who otherwise would have arisen bright and elastic, as after the renewal wrought by natural, unaided sleep, will show more or less of the state just described.

ceives the sulphonal, the latter will be more readily transferred to the mouth. To order or permit suspension in water is to occasion uncertainty as to what part the patient really received, and how much was left clinging to the sides of cup or glass. A glass that has been rinsed several times, with view to insure ingestion of the whole dose directed, may yet show somewhat of the powder clinging to its internal surface. This was first brought to my notice by a personal attempt to suspend a powder in a wineglass of hot milk, with purpose to obtain more prompt soporific impression. So much difficulty attended the scheme, such liability to loss and waste, that the nurses are very few to whom I would trust the giving of sulphonal by this method. Finally, in the rare cases, when we wish to avoid stomach ingestion, there is reason to believe, from various observations lately published, that sulphonal is equally effective, both as to size of dose and time of action, when introduced *per rectum*.

But the third specification—*determination of dosage*—is the prime condition on which rests the successful use of sulphonal; and, for the present, we are concerned only with application of the remedy for relief of insomnia in the adult period of life. First of all, and beyond question, the measures of dosage which accompanied the introduction of this hypnotic, chiefly endorsed by foreign authority, were much too large.* This did not imply danger in the least,—*i.e.*, the dose ranging from 2 to 4 grammes; and it is not impossible that those who enjoyed the rich monopoly, accruing from the sale and successful introduction of the new drug, thought still to increase their gains by directing a dosage doubly and trebly above what we have since learned to be best applicable. It was not long before we came to know that sulphonal posology should be expressed in grains and not in grammes. Often ten grains is shown to be all-sufficient; quite as often fifteen grains proves to be too much in action. Again, continuous use emphasizes an analogy with what was long since demonstrated in our experience with chloral,—*i.e.*, the patient who takes sulphonal, night after night, may, quite likely, require his largest doses at first. He begins, *e.g.*, with 15 grains, and, after several repetitions, finds 12 grains, or even 10 grains, all that is needed to give sleep through the night; later, if he still continue in his use of the hypnotic, 7, or even 5, grains is found to work quite as well. In a few instances, indeed, I have known a patient, for several successive weeks, sleep nightly upon 8 to 10 grains, with no indication, during the entire period, for increment of dose or of diminution of hypnotic energy. My own early employment of *grammes*, as now recalled, has its frequent element of the ludicrous; although, nine or ten months ago, it had its corresponding feature of annoyance for the patient and perplexity for myself. A woman, in particular, thus victimized, a sufferer from a 3-gram. dose, does not intend that the doctor should ever forget her case; she was "demented twenty-four hours after, and stupid and somnolent for a full week!"

Chiefly to such misapplication, such abuse, of the new remedy, associated with non-recognition of the fault by the prescriber or misapprehension concerning the cause of certain sequential phenomena, is to be traced the source of much of the unfavorable conclusions or adverse criticisms which have appeared in the journals respecting the influence and the value of sulphonal. It may well be that the patient who takes 40 grains hardly sleeps more soundly through the night—at least the earlier part of the night—than he who takes but 10 grains; but the experience of the former is not at an end when has come the hour for rising; his punishment is sure to follow. Quite surely his sleep has gained new momentum with every hour after midnight; and, at times, no ordinary means, at the usual hour for getting up, will serve to awaken him and put him in condition to leave his bed. To such a subject might apply in full force the words addressed by the wise man to the sluggard. And worse yet is the state which sets in when forceful measures have for the moment antagonized this stupor; in this is chiefly evident the sulphonal punishment, and this chiefly presents the penalty of overdosage. The somnolency, the yearning for resumed sleep, the inaptitude for all exertion, mental or otherwise, are so emphatic,

* It is a coincidence worthy of remark that a similar observation applies to the introduction of chloral hydrate. My first practical acquaintance with this drug was as advised by Professor Edw. H. Clarke, long the able incumbent of the Chair of Materia Medica, Harvard University, and who directed for the patient, seen in consultation, 30-grain doses, repeated under such conditions and at such intervals that he had received ninety grains at the end of three to four hours; this in circumstances which, but two or three years later, would not have indicated an aggregate dose so large by one-half. The posology of my lectures, also, early in the seventies, represented the established practice of the profession at that period, and provided for 20 to 40 grains as the average adult dose.

so imperious, so raised beyond and above all means of control or mitigation as, repeatedly to the sufferer, to suggest an idea of physical pain; and such intolerable experience may well hold, with no sign of let up, for fully half the day.* Judging from my own practice and the mishaps in the practice of many others, in the earlier period before exaggerated dosage was abandoned, I have often wondered that reaction did not set in, from the cause just indicated, of stress sufficient to emperil the general and further acceptance of the new and valuable soporific on the part of the profession. I know of no sequential influence, from a slightly toxic impression, exerted by any other narcotic or neurotic agent, which has features in common with what are prominently characteristic of such misuse of sulphonal; so pronounced, so distressing, and yet so free from all danger.

But this concerns what is confessedly unequivocally toxic action, or approach to it. The value and use of the new hypnotic should not be affected, in the slightest particular, by considerations based upon what the drug may do when it is grossly misapplied. Where the exhibition of the remedy has been intelligent and the dose rightly proportioned, the patient may be expected to awaken, after a sleep normal both in quality and duration, with much of the vigor and elasticity which, in the healthy subject, marks the renewal wrought by natural sleep. In its right administration and in its best—I may even add, in its *average*—operation, thus conditioned, the man who owes his sleep to sulphonal, in such sleep absolutely sleeps off all drug impression, and the nervous system will no more present sequential trace of this influence than will the alimentary canal.

Thus far the predominant experience has been had in view, allusion has been made to usual, to average results. Sulphonal at times disappoints,—what effective drug does not?—and, in the occasional subject, after repeated trial and renewed effort at adaptation, either proves of little value or declares a pernicious influence. All active remedies, and especially neurotic remedies, are liable to change or perversion of operation through the impression brought to bear by the universally recognized physiological modifiers,—age, idiosyncrasy, etc.

First, as to *age*, and briefly, because the report must be largely negative. As before said, it has been chiefly in the adult period of life that sulphonal has been directed; and such limitation of experience has been general throughout the profession during the past year, judging by the reports and monographs thus far published. Indeed, no positive fact could well equal this negative indication, for the proof it affords that we have at last in our hands *a purely and strictly hypnotic material*, such material being calculated to meet the demand presented by insomnia, and insomnia being a condition of adult life.

As to infancy, I should hardly know how to tabulate dosage to meet the modification herein presented. *A priori*, sulphonal offers the advantages, which no infantile soporific ever offered before, of tastelessness and innocuousness; and, recently, I have more than once prescribed the powder to the subject of 4 months and upward in dose of 2 grains and upward, with permission to repeat *pro re nata*. But, unfortunately, the infant, that does not and cannot sleep, is too often kept awake by gastro-intestinal trouble,—*i.e.*, by some derangement of stomach digestion or by faulty secretion, and resulting pain and spasm, in the intestine, below the stomach. The action of sulphonal upon the entire alimentary canal is absolutely *nil;* surely, it has not virtue in the *rôle* of eupeptic, anodyne, or antispasmodic. The disturbed or absent sleep of infancy must more often find its remedy in pepsin or in some opiaceous preparation rather than in sulphonal.

Nor are we prepared to state how far the condition of *senility* may either justify or modify exhibition of sulphonal. The bromides often fail of their purpose, as given to the aged subject, and there are physiological grounds for their failure. Chloral, otherwise safe, may suggest danger, as thus applied. Sulphonal, in corresponding use, may or may not have less energy, but that it is less safe in the senile than in the adult patient we cannot for a moment believe.

Of the second source of disturbance—*idiosyncrasy*—we have more to say; and, still, what remarks here apply must be put in few words. Whenever sulphonal is found to be unadapted and inadaptable to an individual, whose condition indicated its use, and there-

* *Physical pain.* More than one such sufferer has of himself suggested such analogy. "Why, I would suffer real pain rather than go through with it again!" This has been said more than once. One individual quaintly compared a recent experience with what he had remembered through life and could never forget,—the agony often inflicted in early boyhood, when he had been made to sit erect and keep awake during a long sermon in church.

fore some other hypnotic must be substituted, the idiosyncrasic disability may be referred to either one of two types. First, the patient does not and cannot yield to its ordinary physiological influence,—he sleeps little better than he does without the drug; or, again (second type), whatever experience he may have had through the night, as respects sleep, and however moderate the dose, he suffers for a considerable part of the next day with somnolency, heaviness, and perhaps dizziness; in a word, toxic action follows medicinal dosage. I have observed so small a quantity as 5 to 8 grains produce this effect in a few individuals. If the subject who presents the first type be pressed with larger dose,* it is not at all certain that his sleep will be improved either in quality or duration, but he is almost sure to suffer from the phenomena just noted, hours after all trace of physiological impression should have disappeared. Fortunately, this twofold constitutional perversity, *quoad* sulphonal, is not often encountered in either form; but of its existence I have had unmistakable evidence more than once. When it does obtrude, as in all else respecting idiosyncrasy, in the impression of whatever drug, the patient *a priori* seemed to be as favorable a subject for a trial of the new hypnotic as had the ten or more preceding persons who had taken sulphonal and shown only its best effects.

Mental states, cerebral conditions, both as respects brain function itself and modified blood circulation through the brain, are recognized as exerting various influence upon the physiological action of chloral and the bromides. How such conditions may modify the operation of sulphonal (whether, *e.g.*, *cet. par.*, its action is more readily procured, more kindly, is longer maintained in the anæmic than in the hyperæmic brain, or *vice versa*), we have no data on which to advance an opinion. But one fact, if it be a fact, as we are well assured it is, having close relation to this department of the subject, is of value and significance.

It was surely an astute observer who, among the earliest writers on the new drug, placed it on record that sulphonal is particularly applicable to the insomnia which originates in, is characterized or aggravated by, "worrying and anxious thoughts." This has proved emphatically true in repeated cases of my own. Such mental state will often convert opium into an excitant with the patient who, in calm mental status, has previously been shown to be susceptible of calmative action on the part of this agent, and even occasion like miscarriage in the operation of chloral. But the man who carries "his business to bed with him," in a season when business is bad, margins small, or when wreck is feared, the insomnia which has its source in the grief of bereavement, at times, would even seem to invite the sleep-compelling power of sulphonal. As thus far observed, one of the most gratifying, one of the most beneficent, offices of the new soporific corresponds to this peculiarity of action.

Finally, shall we refer to the class of physiological modifiers, shall we ascribe, preferably, to idiosyncrasy the rarely observed phenomena, lately noticed in the journals, where perplexing or alarming sequelæ appear to have been developed after the ingestion of a moderate dose? Shall we refer the cyanosis of one clinical reporter, developed the following day in a patient who slept upon 30 grains, to this remedy and such dosage? or the eruption of another record, following moderate exhibition, which covered the entire cutaneous surface, and resembled measles? I myself certainly have had no experience at all answering to such observations, and I am incredulous as to their correctness, as involving any responsibility of sulphonal. Not many years after the introduction of chloral, Liebreich wrote a memorable paper, in which he attributed a very large per cent. of the mishaps, which had attended its use hitherto, to grossly impure specimens of the drug, which had been made to flood the market, adding, that the American drug market had sinned and suffered above all others in this respect. If the close monopoly, which has thus far controlled the sale of sulphonal, and maintained its cost above all considerations of justice and reason, shall protect us against the adulteration which, in the early history of chloral, beyond question, distributed danger and death far and wide, and wrought early prejudice against an invaluable drug, perhaps we can well afford to pay so high a tax; but there are already indications that the physician cannot always depend upon the purity of the sulphonal prescribed to his patient. In a word, all doctors are not good observers, all druggists do not dispense pure drugs. Responsibility for the faults of recent allusion

* It is right to repeat,—the assertion cannot be too strongly emphasized, it concerns a law governing the physiological action of this new remedy,—*the usual subject of insomnia who does not sleep upon a dose of* 10 *to* 20 *grains,* 10 *to* 15 *grains, is not amenable to its influence in any measure of dosage.*

must, pretty surely, be placed elsewhere than upon a correct and skilled exhibition, and corresponding operation, of our newly-acquired hypnotic!

Once more, and briefly. How certain morbid modifiers may influence the action of sulphonal, as otherwise observed, is a question of great practical interest; but, unfortunately, such answer as can at present be given must be largely negative. How does pyrexia, heated blood, the throbbing arterial vessels which carry such blood to the brain, affect sulphonal in its function of procuring sleep? We are not prepared to say; but the clinical note which follows has significance and all the value which can accrue from a single observation.

Is sulphonal safe, or is its action cumulative, and so toxic, after a few repetitions of dose, in renal disease, where kidney function is much impaired or practically suspended? Upon this problem our brief record bears. Again, a large majority of medical materials are eliminated by the kidneys, chiefly or altogether. Do we yet know through what organ, by what avenue, sulphonal leaves the system?

A man of age past 50, dying with the slow, torturing death which attends progressive pulmonary œdema, in the last stage of waxy kidneys, and apparently dying from such condition alone; deprived even of the doubtful comfort derived from that animal opiate which kidneys that have nearly lost their function sometimes permit to accumulate in the blood; cyanotic, orthopnœic, with hippocratic face; unable to sleep, nor daring to sleep if he might. Here sulphonal, given in 8- to 10-grain doses, at two to three hours' intervals, proved a boon indeed, and was not long in setting up a state which steadily developed into a veritable euthanasia. A degree of soothing and calmative influence was apparent after the second dose, and frequent but brief periods of sleep soon followed, which had been absolutely absent for forty-eight hours before. In a word, the new drug seemed to be the only drug which could have been availed of. Both opium and chloral were clearly contraindicated, and the bromides would have been little else than an aggravation.

In conclusion, gentlemen, I believe sulphonal to be *the hypnotic* in eight or nine out of ten cases requiring hypnotic resources, as presented to the physician. And here I speak, as I have spoken from the first, from the stand point of the general practitioner. Perhaps it has not the energy of chloral in cases offering violent resistance, as, notably, in the maniacal subject, although even here it may be presumed that repeated dosage and accumulated influence may sometimes control where chloral, within limits of safe exhibition, has proved inadequate. But this apart, the application of our new remedy is practically confined to such as will yield to its power in quantity varying from 10 to 20 grains. A large majority of subjects of insomnia, as before said, will find in this measure the relief that is sought.

Already has sulphonal, as remarked in the early part of our paper, established its claims of first rank in the class of materials prescribed for procurement of sleep; and yet only one year ago its name had hardly been heard among the profession. But, on the other hand, it must be confessed that it is the infrequent practitioner, even at present date, who has formed such acquaintance with the new drug as to be able to give an independent opinion upon its merits; while, correspondingly, innumerable patients have been denied the aid and comfort only to be derived from this source. Two adverse conditions have served to delay its prompt and general acceptance by the profession,—first, its exaggerated and reprehensible cost; and, second, a not unnatural hesitancy with physicians to accept a new remedy because of past promises, in repeated instances respecting other materials, which were never kept. But, however often he may have been disappointed or deceived in the past, the progressive physician can no longer safely hold a sceptical attitude towards the development of therapeutic resources, in consideration of the fact that the period is much briefer than a decade which has produced antipyrin, acetanilide, sulphonal, and many other additions to our pharmacopœia of like value; while we are surely in position to insist that the materia medica teaching of twenty years ago, and which then had the mark of immemorial antiquity, has lately received, in an important particular, modification and extension, our remedial agencies no longer being drawn from "three kingdoms of nature" but from four,—viz., the mineral, vegetable, animal, and *chemical* kingdoms.

SUPPLEMENTARY NOTE.—The disparaging remark made respecting the hypnotic virtue of opium seems to demand slight qualification, and also suggests one or more practical observations of close relation. We have long

been used to teach and receive that opium has two general uses,—innumerable as its special uses may be,—corresponding to its application for relief of pain and for procurement of sleep. But the fact seems to be that while this material, wisely directed as anodyne, is more constant in its beneficent action than is that of almost any other drug, for whatever purpose employed, negation, vexation, aggravation commonly attend its service as hypnotic. None the less, there are rare cases, but unmistakable and otherwise uncontrollable as they are rare, in which opium proves to be the only effective soporific which the physician has at hand; whether it be used alone or as the agent of power in combination. In this connection is recalled a case seen during lecture term last year, and which is illustrative, although it was not observed with purpose of study. A rather stalwart medical student, down with typhoid fever, and sleepless night after night. Chloral alone, and in combination with sodic bromide, in repeated and raised doses, seemed hardly to touch the patient; but a moderate dose of Dover's powder brought sleep on first trial.

But the case which follows, and which shall be cited in terms as brief as possible, drawn from my clinical experience of the past month, seems to claim the space given to it as illuminating not alone the question at issue but other phenomena of hypnotic medication. A man, æt. 50, of weight above two hundred pounds, and of size and muscular development such as to render his weight only normal. Long engaged in arduous and prosperous business; of habits so strict that he did not even smoke. No weak point in heredity, no organic disease or disorder. Had long suffered from insomnia; could not remember for many months past when he had had eight hours sleep of a night. Had previously consulted various physicians, and had evidently made rapid transit from one adviser to another; had taken counsel of the homœopath, who measured out for him sulphonal in 30-grain doses; and had resorted to regular physicians, who had not given him the advantage of a trial of chloral. The latter fact was made evident soon after the case came into my hands.

The first night I ordered two powders of pulverized sulphonal, of 15 grains each, with one and a half hours' interval between doses; these to be followed later by 20 grains of chloral, if chloral should be required. Report next morning: took all that was prescribed, slept eight hours, "am half well already!" Here I made the mental note that sulphonal is quite likely not to be trusted to in conditions presenting great resistance and demanding positive therapeutic energy of action; for evidently it was the chloral that gave sleep. The second night prescribed freely of chloral alone, and failed miserably of my purpose. The third night resolved to mass doses,—still using chloral alone,—making them larger and fewer in number. The nurse was instructed to give 50 grains (!) chloral at bedtime; if patient awakened at any time short of eight hours, to give 30 grains more, and later, under same condition, 20 grains. Left the patient with slight misgiving; but the case was one calling for heroic medication, and "there are times when the physician must assume to be the 'master of nature.'" Report next morning: patient had taken his hundred grains of chloral in the space of about four hours, and had had about five hours of broken sleep. Here I made a second mental note, in effect that certain cases presenting *great resistance, and demanding strong therapeutic energy*, may show chloral to be about as ineffective as sulphonal.

The next night a preliminary 30-grain powder of sulphonal was given, and 2 hours later, as the patient got into bed, was administered *per rectum* a suppository containing half a grain of morphine and one-third of a grain of extract of belladonna; and at this point, and by such method, the problem was solved. Here was made a third mental note, of character to suggest and justify the present supplementary discussion,—to wit, that, in rarely encountered cases, our most valued hypnotics, and those of daily trust, altogether fail us, and opium alone proves the agent of power in procuring sleep.

None the less, there is already somewhat of evidence for belief that a preliminary exhibition of sulphonal—as after the analogy of such use and service of a bromide, but more emphatically—is efficacious in rendering opium soporific, which, otherwise, might have proved excitant and agryptic.

A final observation in respect of recourse to opium as a hypnotic; and I desire to present it with especial emphasis, for it concerns a practical point which has been too seldom taught and which is too unfamiliar with the profession. Its uncertainty of action is not its only fault, is not its gravest misdemeanor, —*i.e.*, as respects the exertion of a soporific or of an excitant influence. The drug is dangerous from a therapeutic, as it is often disappointing from a physiological, stand-

point. The insomnia which finds its relief in opium rapidly demands increase of dosage; and when an attempt is made to shake off such dependence, though the period of resort to opiates may have been the briefest, there almost surely returns in exaggerated form the original disability; the insomnia is more unruly and exasperating than before the opium was used. It is thus from a special and an additional condition that the man who gets his sleep through this drug is in peril above him who employs it for relief of pain.

Contrast such record with that of the successful application of chloral and sulphonal. In extreme conditions, I have known a patient to depend upon the former for months together (even for six months), and the latter for several successive weeks, for his nightly sleep; and, aside from need of increased dosage, quite often the original quantity was progressively diminished.* And thus far, not only, but when the right time has come, when is declared the condition which gives evidence that brain and nerve have been sufficiently restored through normal sleep, secured without intermission night after night, the nightly sleeping potion has been dropped all at once, and the patient seemed hardly—or was not at all—conscious of its loss. This is equivalent to saying—and it is not too much to say—that a true hypnotic, skilfully applied to a typical case of insomnia, is *curative*. It used to be held, in the earlier experience with chloral, that this agent could only serve as a temporary and palliative measure, could only afford relief for the time, until the condition which caused the insomnia should be otherwise, by other agencies, removed. But we have long since come to know that whatever the means, artificial though it be, which provides physiological sleep, and which, by repeated use, substitutes a habit of nightly sleep for the habit of nightly sleeplessness, the same thereby and through such operation of itself cures insomnia.

In conclusion, we cannot withhold the remark that our small class of soporific remedies, lately so strongly recruited by the addition of that which has formed the subject of our paper, has too often suffered, been misapprehended, been harshly judged, not alone by the secular press and the public, but by representatives of the profession. Their misapplication, by way of indulgence, and with result of more or less constant intoxication, is an evil of wide extent, and fraught with fearful consequences beyond question. But the prominent notice taken of the occasional chloral habitué, in whose behalf is sought the protection of an asylum, or who ends his life by suicide, the public fulminations against the doctor who will use so deadly a drug, and the accompanying plaudits of the homœopathic doctor and his little pills, are urged by no kindly spirit and serve no good purpose. Let us look at the other side of the shield. How is it with the hundreds, nay, the thousands, throughout the land, who are every year saved by the timely and judicious use of hypnotics! Our captious critics disregard this aspect of the question; and who, thirty years ago, would have brought up in the insane asylum for the want of the bromides, chloral, sulphonal, in the practice of a school of physicians which possessed no specifics for the relief and cure of insomnia, for the procurement of healthy sleep.

* As before said, and as concerns the temporary use of sulphonal, we often first order 15 grains for a night or two, then drop down to 10 grains; and if the soporific is still to be continued, 7 to 8 grains proves all-sufficient. What physician of experience would dare to apply a corresponding method in his use of opium for soporific action!

THE DIARRHŒAS OF NURSLINGS AND THEIR THERAPEUSIS.

By G. Archie Stockwell, M.D., F.Z.S., Detroit, Michigan.

(Concluded from page 521.)

TREATMENT.—Admitting a cause which the diarrhœa seeks to mitigate, by what rule of thumb or therapeutical philosophy is the malady to be remedied by efforts that tend to repress the flux to the retention (and absorption) within the economy of the very effete, noxious (and perhaps toxic) factors that are the source of the disturbance, and in the removal of which Nature is engaged?

By what measurement of common sense may the exhibition of an antiseptic, as such merely, be expected to combat a malady dependent upon malnutrition and non-assimilation, since antisepsis is merely the antithetic foe of fermentation and putrefaction, and deals with a product instead of a definite cause? It may mitigate as regards virulence; it may tide over until Nature can recuperate sufficiently to perform her own work; but it can by no stretch of the imagination be considered to remove the cause.

To secure a condition inimical to the diarrhœa, is demanded perfectly healthy digestion and absorption. To retain this condition, or to prevent the accession of diarrhœa, food precisely suited to the powers of the digestive organs must be supplied, and regularly, and moderation insisted upon.

In diarrhœa, as already mentioned, we are concerned first of all with perverted digestion, and irregular gastric, pancreatic, and biliary action,—the two last being mutually dependent upon each other,—and the absorption of ptomaïnes or kindred poisons which Nature is vainly attempting to exclude from the economy. The indications, then, are: *First*, to remove the poison and source of irritation; *second*, to restore to the secretions their normal constituents, thereby insuring proper digestion; *third*, to combat such inflammation as may have arisen from poisoning and non-assimilation; *fourth*, to restore to the economy at large, and as speedily as possible, that of which it has been deprived; *fifth*, when the discharges are so profuse as to threaten collapse or otherwise endanger the life of the creature, to check the same by the method that will most surely suppress the waste of serum, and least tend to absorption of toxics,—ptomaïnes. These last two propositions are in a great measure dependent upon the second, and indirectly also the third.

To attempt to arrest the flux simply by means of astringents, singly or combined with opiates and antacids, is, as a rule, pernicious, since it tends to aid the very processes that it is desirable to suppress,—viz., the absorption of ptomaïnes. There are cases, however, of extreme emergency, where suppression of the diarrhœa is imperative, but even these are not, as a rule, benefited by astringents purely. Opiates relieve suffering, but also, when administered without due consideration of physiological action, lock up the secretions, normal and abnormal alike; the ill effects of such therapeusis may be seen in calves, when the farmer's wife essays to check the scouring, and, if successful, locks up an indigestible mass in the intestines, to the induction of an enteritis, or provoking a gastric catarrh that later proves fatal. Fatality is, of course, laid to the exhaustion produced by the diarrhœa, instead, as should be, at the door at the astringent. Opiates, moreover, are most uncertain in the infant economy, and it is impossible to so regulate the administration as to hold unencroached the border line between sedative action purely, and narcosis; further, they are very apt to prove cumulative in action in nurslings. Mention has already been made of the introduction of antiseptics in summer complaints, and that such introduction is tacit admission of the inutility of remedies heretofore deemed "classical."

What, then, are the therapeutic measures most available?

First, mercurial or other alteratives of like action; *second*, pepsin, pancreatin, bismuth, cerium, antipyrin, chloral, wild yam, leptandrin and drugs of its class, hydrastin, salicylic acid, lactic acid, carbolic acid, mineral acids, quinine; *third*, tonics; *fourth*, strict attention to diet.

A full dose of mercurial or other cathartic (not less than 2 to 5 grains of calomel for a child under 1 year of age, with rhubarb and camphor mono-bromide to prevent griping) clears the intestines of irritating matters, changes the character of the secretions towards normal, and by stimulation of mucous follicles clears their orifices and substitutes mucous for serous exudation. This alone, after the cathartic effect has passed off, will show great diminution in the diarrhœa, and less serosity. Next should follow remedies to re-establish normal secretion and digestion, to relieve inflammation, and check excessive peristalsis, and to further the neutralization and expulsion of any remaining poison. First, now, pepsin and pancreatin (and perhaps acids) come in play. Second, the antacids, of which the best are cerium oxalate and bismuth subcarbonate. After calomel, for a few hours, perhaps mineral acids are best avoided, and the lactic acid substituted, though salivation is all but impossible in any nursling infant; but leptandrin, ipecac in minute doses with sugar of milk, irisin, euonymin, baptistin, and especially hydrastin, with quinine, continue the good action of the mercurial, and tend to check the flux, especially if combined with cerium and camphor bromide. In the mean time, pepsin and pancreatin are advantageously prescribed in connection with feeding, as hereinafter mentioned, though the former may be added to the alteratives by omitting the cerium or bismuth; for reasons obvious, also, these are often best administered suspended in some mucilaginous vehicle, as tragacanth or acacia. Regarding antiseptics, it may be remarked, such are not demanded as direct remedial agents, though they oftentimes prove valuable adjuvants, especially chloral and antipyrin. Complete digestive activity presupposes perfect antisepsis; experiment outside

the body has demonstrated that in the normal condition the digestive secretions, whether from the salivary glands, from the stomach, or from the liver, show a remarkable power of resistance to putrefaction. Although the entire quantity of the digestive fluids seems large, it must be remembered that they are absorbed almost as soon as they are poured out, so that there is no excess of fluid in the tract during digestion. In the gastric secretion, the hydrochloric acid is held to be the main cause of this antiseptic action, although when pepsin is secreted in proper quantity and of normal activity, it also contributes to this effect by the promptness of its action; and, moreover, the quantity of the gastric juice and the rapidity of its reabsorption, under normal circumstances, would be highly unfavorable to the occurrence of septic changes. Another fact may be assumed to have some weight in this matter. These fluids that are separated from the blood in such quantity are returned to it so rapidly that for practical purposes they may be considered as still constituting a part of the circulating fluid; in other words, living fluids have a certain power of resistance to septic change, and when in normal condition, the blood has this quality, and the digestive fluids are a part of the circulating fluid, only temporarily separated from it.

When diarrhœa is exhaustively depleting and of serous character, so much so as to admit of no delay, fluid extract of coto-bark (or its alkaloid cotoine), with or without an equal quantity of fluid extract of wild yam, accordingly as there is, or is not, evidence of severe griping, will answer every purpose of an astringent, without the pernicious action of the latter. It appears to be a stimulant alterative and stomachic, increasing the appetite, lowering temperature, and at the same time antiputrescent and antizymotic: it is specific in that it modifies and restores the functional energy of the intestinal epithelium, and, temporarily at least, neutralizes the toxicity of ptomaïnes. It is insoluble in gastric juice, but readily soluble in intestinal fluids, and does not in any way modify peristalsis. When the pain is manifestly severe and colicky, wild yam, or some substance that will control peristaltic action, is indicated, and if it seems desirable to anæsthetize the intestine, chloral or antipyrin are advantageously employed. The rest thus given the bowel is often of incalculable value, not only in relieving inflammation, but in allowing Nature an opportunity to resume her sway.

After the administration of chloral or antipyrin, or after the inflammation is calmed by coto and yam, pepsin and pancreatin come in play, and also the alteratives, including quinine* and antacids. In diarrhœa lienteria, trypsin or pancreatin is imperatively demanded. As Professor Lesage truly remarks, "It is the only remedy that does any good, except a purgative, which may be given for the purpose of clearing out the fermented and undigested milk." When pepsin is employed, however, the antacids must be given separately, and with considerable interval between the two; for as pepsin acts only in an acid medium, the addition of bismuth, cerium, or other antacids is alike unchemical and unphysiological, the action of the former being prevented or neutralized. The good effects so often claimed of this combination, are due solely to the mechanical action of the antacid in spreading itself over inflamed surfaces, and thus temporarily relieving irritation.

When the diarrhœal disturbance can be traced to some fault in the economy of the parent, this should be looked after and remedied. A saline aperient administered to the mother at occasional intervals, is especially valuable when there is a tendency to diarrhœa in her infant from indigestible curding milk, or from unknown causes. Indeed, when diarrhœa appears, it is often advisable to remove the babe from the maternal breast, and hand-feed, in order to insure proper nourishment.

When the dejections of the babe are freely acid, fatty, and manifestly accompanied by tenesmus, it is more than probable the primary fault is imperfect or improper pancreatic digestion, when pancreatin is demanded (perhaps in connection with an antacid and alterative) to aid in restoring the function; *per contra*, if the fæces are abundant in curd, pepsin is required to be exhibited. Both conditions may, and do, obtain together. Again, light colored dejections denote deficiency in biliary products; but if dark and green, the reverse. But it must be remembered, as before noticed, that lack of biliary secretion is too often a concomitant of defective pancreatic secretion in nurslings; also that biliary excesses are likewise accompanied by pancreatic excesses, when the stomach is almost certain to be deficient in the material by which its contents are transformed into peptones.

* Quinine is especially valuable in that it is antiseptic and antifermentative; and it diminishes tactile sensibility and increases the volume of the red corpuscles by increased supply of oxygen.

Digestive Ferments.—In most forms of diarrhœa the sheet-anchors of treatment, so to speak,—*i.e.*, after the irritating ingesta are gotten rid of and immediate inflammation allayed,—are the digestive ferments,—pepsin and pancreatin. These are the only strictly physiological remedies of which we are possessed, and, most unfortunately, are generally overlooked, and as generally, perhaps, misunderstood as to their therapeutical application and value. Further, a fact not generally known is that both these ferments are much more definite and certain in their effects in the *primæ·viæ* of nurslings than in adults, and for the reason that greater demands are made upon both, and the natural supply of ferments depend upon the exact character and quality of the food supplied.

Pepsin as a therapeutic agent has never been obtained as a distinct principle in a complete state of purity, but is contaminated in greater or less degree with substances which are themselves inert, but present insurmountable difficulties in separation. Acting in an acid medium, it exercises its digestive function upon albuminoids solely; for this reason its popular administration, in connection with an alkali, such as sodium bicarbonate, is a source of grievous error. Its employment must be decided upon from a strictly chemico-physiological stand-point, and the above facts borne in mind, for it is very far from being, as is generally and popularly assumed, a universal digestant.

The action of pepsin, too, is in a sense catalytic; and theoretically a small quantity should digest an unlimited quantity of albumen. The conditions for such action, however, do not exist within the human or animal economy, especially in the class of diseases to which the remedy is applicable; we cannot rationally expect a minute quantity of the remedy to digest food unreasonable both as to quantity and quality. The general failure of pepsin in theoretical and therapeutical applications, aside from the causes already noted, are from the exhibition of small and inefficient doses, or from employing an inferior and perhaps insoluble article. A large proportion of the pepsins in the market are known to be insoluble and inert; all vary in quality, and may, moreover, contain elements that are themselves pernicious, and of the very class and character of those it is desired to get rid of that are concomitants of the disease,—viz., ptomaïnes. Professor Victor C. Vaughn (of the University of Michigan) asserts this as a fact of most, if not all, low-grade pepsins; and when we consider the mode of manufacture and production, we can readily understand why this is so. For these reasons, I deem it fit to present the results of the analyses of the best-known products, as made by John R. Winslow (Professor of Chemistry, Woman's Medical College, Baltimore) and R. H. Chittenden, Ph.D. (of the Chemico-Physiological Laboratory of Yale University), of pepsins purchased in the open market, as a guide to intelligent administration and employment. These analyses together are substantially as follows:

1. Parke, Davis & Co.'s, 1 grain dissolves 2000 grains of albumen.

2. Fairchild's, 1 grain dissolves 1200 grains of albumen.

3. Scheffer's, 1 grain dissolves 960 grains of albumen.

4. Jensen's, 1 grain dissolves 700 grains of albumen.

5. Ford's, 1 grain dissolves 640 grains of albumen.

6. Merck's, 1 grain dissolves 320 grains of albumen.

7. Boudault's, 1 grain dissolves 280 grains of albumen.

8. Royal Chemical Company's, 1 grain dissolves 180 grains of albumen.

Thus, all other matters being equal, a double quantity of No. 2, and twelve times as much of No. 8, must be administered to secure the same result obtained by No. 1. My personal preferences, however, are for No. 1 and No. 7, both of which are sheep pepsins, and less likely to contain insoluble and ptomaïne products than any of the others. The separation of pepsin from the stomach of the sheep is attended with less difficulty than from that of the hog, and is purer, though of less proportionate quantity. The above experiments, being purely chemical, represent possibilities obtainable in the laboratory, but not, of course, uniform in the stomach. Digestive power, within the economy, as before noted, is considerably less (for reasons which cannot be entered upon in this connection), and further modified by circumstances,—disease, character of the food, amount of fluid taken, etc.

Another phase also is presented when we consider the character of these insoluble varieties. Mucus, which is a product in the preparation of the cheaper pepsins, and consequently intimately mixed therewith, rapidly undergoes decomposition on drying, such being the result of the action of ptomaïnes. Now the decomposition of mucus procures

cadaverine, one of the most poisonous of all the animal alkaloids, and the effect of administering insoluble pepsin to an infant whose entire alimentary canal is in an inflamed and abnormal condition can well be imagined.

The pancreatic secretion consists of a combination of four distinct ferments, which seem happily designed to supplement and complete the work left unfinished by the secretions of the parotid and submaxillary glands, and the stomach,—first, amylopsin, similar in action to diastase, converting the starch into dextrin and sugar; second, a curdling ferment, acting on milk in an analogous manner to rennet, or the curdling ferment of gastric juice; third, trypsin, having powerful peptonizing properties; and, fourth, steapsin, known as the fat-splitting or emulsifying ferment. The chief of these ferments, and the one of paramount importance, is trypsin.

Pancreatin, which represents all these ferments, has an extended range of activity, and, unlike pepsin, acts in an alkaline medium, and is usually advantageously prescribed in connection with soda. For like reason, also, pancreatin and pepsin may not be prescribed together, but the former should precede, and the latter follow, the taking of food.

In all diarrhœas the best results of pancreatin and pepsin are obtained when the little sufferer is removed from the parent or nurse, and hand-fed with milk that has been rapidly and artificially cooled, and duly diluted with cold water previously boiled, and peptonized. It may further seem advisable to remove a portion of the cream from the milk, substituting instead a small amount of some farinaceous product, such as roasted malt or flour. The fact has long been recognized that bland and easily-digested farinaceous substances, or even minute portions of cellulose, mixed with milk, aid in preventing casein from forming large and firm masses in the stomach by mechanically separating its particles. Again, the addition of a little table salt to diluted milk has a most happy effect, as it delays and renders difficult the firm curdling of milk by rennet (*Pflüger's Archiv*, xiii. p. 93); thus, it should be added to cow's milk, as a rule, when it is not peptonized, and to woman's milk when large curds are brought up by vomiting or appear in the diarrhœal discharge. This insures more even feeding, and better action of the digestive ferments. With the food may be administered pancreatin; after feeding pepsin, if required. Between feedings, alteratives, antacids, and antiferments may be employed, if desired, such as charcoal, naphthalin, lactic or carbolic acids, creasote, and iodine, which last three should, however, be given by themselves, and in small and oft-repeated doses; mercury deuto-iodide, answers a like purpose, but is less soothing to the irritated intestinal tract; and, when severe pain is present, salicylic acid is often advantageously substituted. Marked tenesmus, however, is better relieved by chloral-hydrate or antipyrin (perhaps in connection with wild yam), either of which anæsthetize the intestinal tract, and at the same time in no way interfere with its normal functions other than by decreasing peristalsis. Both, also, are antiseptic to greater or less degree proportionately to the doses employed, and vastly superior to any preparation of opium.

In the majority of cases, pancreatin, or pepsin (or both), as occasion demands, is all-sufficient to relieve a simple dirarhœa and restore healthy secretions. When the pancreatic fluid is wholly and normally restored, abnormal fermentation becomes impossible; and the biliary secretions are brought in accord therewith by the action of some mild alterative, as leptandrin or euonymin, or, better yet, hydrastin, combined with ipecac in minute doses, along with cerium oxalate.

Pancreatin should, as before remarked, be administered a few moments prior to feeding, or, in other words, before the secretion of acid liquid and pepsin has been provoked in the stomach by the presence of food or peptogens. The object to be thus gained is, to remove the pancreatin from the possibility of destruction, and into the duodenum where it exerts its action, and where it properly belongs.

"Peptonized" (or pancreatized) milk is unsurpassed in the prophylaxis of diarrhœa in the young, and is also a valuable adjuvant in the management of the malady. It cannot be too highly extolled where epidemic or endemic fluxes threaten in a community, since the casein contained is transformed into flakes that are readily digested, causing no suffering or gastro-intestinal irritation. It may be prepared by adding two or three teaspoonfuls of liquid pancreatin (or five grains of "pure pancreatin") to a gill of cold, boiled water, in which has previously been dissolved a scruple of sodium bicarbonate, and adding to a pint of milk warmed to 110° to 115° F. This mixture should be set in a warm place until the opaque whiteness of the milk gives way to a grayish color, or a slight bitterness is developed, when it may be removed

to the ice-box, spring-house, or otherwise rapidly and artificially cooled in order to suspend further digestive action. It should be used before many hours have elapsed, as it does not keep long; or, better yet, made fresh as required. When farinaceous additions are to be made, if roasted, they are best stirred in the milk when the latter is warm. Another equally good plan, one by which the roasting is avoided, is to make into thick gruel by boiling, subsequently thinning one-half, and adding to the peptonized milk in the proportion of 1 to 4 or 8 of the latter. "Pure pancreatin," so called, is a misnomer, since that which is sold under the name is simply a highly-concentrated preparation containing the various digestive ferments of the pancreatin secretion; such title is of empiric origin. Pancreatin should, however, be of definite, known strength, and five grains with a scruple of soda should completely peptonize a pint of milk at a temperature of from 110° to 115° F. in half an hour. If such proportion of pancreatin to milk fails to peptonize, such is *prima facie* evidence of the utter worthlessness of the ferment.

Milk containing a large proportion of casein will sometimes curdle under the influence of the pancreatin, a difficulty that may be obviated by increasing somewhat the proportion of water and of pancreatin, or reducing that of milk.

Heat is not necessarily a concomitant of the pancreatizing process. If preferred (and it is sometimes advisable), the milk may be diluted with half its volume of lime-water, pancreatin being added in the proportion above given, and the mixture allowed to stand for three or four hours at ordinary temperature, occasionally stirred. Peptonized milk, however, must not be considered as at all meeting the indications of treatment in diarrhœa, for such, far from being a remedy, is merely a food that can always be made of like quality, and administered in such quantity and frequency as the individual case demands. It is an easily assimilated and highly nutritious article of diet, which generally proves acceptable even to the most irritable stomach, and is eminently useful in organic gastric affections, and all wasting diseases, chronic or acute, in children or in adults. On this account it is more nourishing than milk from the maternal breast, and much more acceptable to irritated and inflamed digestive tracts.

Pepsin when administered should follow the food by perhaps fifteen minutes, and is often advantageously given in a little weakly-acidulated fluid; also it is sometimes advisable to add some stomachic to each dose for the purpose of stimulating the action of the stomach, when the so-called concentrated glycerole of the remedy is preferable, one minim of which as prepared is supposed to be capable of digesting one hundred grains of albumen. By its aid the difficulty of making durable liquid preparations of pepsin is overcome. Thus—

℞ Glycerole of pepsin (*pepsinum ovis*), ♏clx;
Hydrochloric acid (U. S. P.), ♏lxxx;
Glycerin, ʒvss;
Water, sufficient to make ʒxvi.

This forms a very satisfactory solution, possessing slightly acid reaction.

Also an elixir of pepsin may be made, equally efficient and of like reaction, and is most available for infants because of the combined stomachics and carminatives.

℞ Glycerole of pepsin (*pepsinum ovis*), ♏cxl;
Hydrochloric acid, U. S. P. (or lactic acid, ♏lx), ♏xxx;
Water, ʒii;
Aromatic elixir, sufficient to make ʒxvi.

Each fluidounce contains the equivalent of forty grains of saccharated pepsin, U. S. P., or, in other words, one grain of pure pepsin (P., D. & Co.'s). There is not sufficient alcohol in the elixir aromatic, usually, to materially interfere with the action of the pepsin.

The elixir is just four times as strong in pepsin, and the dose may be regulated accordingly; but it must be remembered also that doses are to be regulated largely by the age and condition of the patient.*

* So long ago as 1856, Joulin and Corvisart (*Rev. Méd.-Chir. de Paris*) outlined this mode of treatment, and claimed the happiest results therefrom; and more recently it was advocated by Trousseau, Pidoux, Barthez, and Rilliet, of France, and Ellis and Davidson, of the United Kingdom. Later still, Dr. J. Milner Fothergill ("Handbook of Practice," p. 40) remarked of pepsin: "Its utility in the treatment of imperfect digestion, and diarrhœa in children, is certain." Professor J. Lewis Smith (Professor of Diseases of Children, Bellevue Hospital Medical College, *Archiv. of Pediatrics*, 1866, p. 518) expresses exactly the same opinion. Professor Frederick John Farre (Pareira's "Mat. Med. and Therap.," p. 943) commends pepsin "*very highly in cholera infantum and summer complaints of children.*" And Bartholow declares ("Mat. Med. and Therap.," p. 68): "Very great success has been attained in the treatment of the *diarrhœas of infants* by pepsin. . . . The motions will be quickly changed in character, and the nutrition of the child improved, by giving it immediately after each supply of food." He further recommends (Naphey's "Medical Therapeutics," p. 395) the employment of peptonized milk or milk-gruel for food in these cases, in which

In diarrhœal disorders, lactic acid has obtained some celebrity because of its supposed antiseptic effect, whereas the real secret is its aid to gastric digestion, and the production of pepsin in the stomach; and for this reason it is an excellent medium for the exhibition of the gastric ferment. During treatment by the digestive ferments, little nourishment should be allowed, comparatively, but cool (boiled) water fed instead; and the little food permitted will be none the worse if diluted and pancreatized. At night all feeding should be interdicted, though cold (boiled) water slightly sweetened with loaf-sugar may be allowed. Slightly sweetened water is more palatable, and more readily quenches thirst than water alone, besides, is slightly nourishing. Much as mother's milk is desired in these cases, the very anxiety of the parent oftentimes exerts a most pernicious effect upon the mammary secretion. Therefore, in all serious diarrhœas, hand-feeding is best substituted. Apropos of this, it may be remarked, that in the orphan asylum at Rochester, N. Y., fatalities from diarrhœa altogether ceased by interdicting food, except at comparatively infrequent but regular intervals. The order was, "Feed only every three hours during the day; not at all at night; but allow water at all times." But the nurse, by some misunderstanding, fed the little ones *only thrice daily*. The moral is obvious!

DETROIT, MICHIGAN, July 4, 1889.

THE EFFECT OF THE ENTRANCE OF AIR INTO THE CIRCULATION.

BY H. A. HARE, M.D. (UNIV. OF PA.).*

BOTH from the side of physiology and practical medicine this question is one of great interest to every one. At the present time we are taught by all text-books and lecturers that the entrance of air into a vein is one of the most serious complications which may occur during an operation, and that in the vast majority of cases such an accident is followed by death. The object of this paper is to show that there is by no means so much danger as is thought, and to prove by actual experiment that the air on entering a vein is not capable of exerting deleterious influences. In a series of experiments, recently carried out in the University of Pennsylvania, on over seventy dogs the results which follow were obtained, and it is only because I have so large a mass of material that I am bold enough to contradict the wide-spread belief of most surgeons.

As it is not only impossible but unnecessary to give all the records of my experiments, I shall simply detail a few whenever it is necessary for me to illustrate a fact, asserting at the same time that the result of each was absolutely identical in proving that the entrance of air into a vein, at least in one of the lower animals, is not dangerous.

The quantity of air so injected by me into the jugular vein of these animals has varied from a minute bubble to forty cubic centimetres, and the rapidity of injection has been almost instantaneous,—as rapid as the piston of the syringe could be shoved downward. As the dogs have been of all ages, sizes, and breeds, and in all states of health, it would seem that no doubt can exist as to the correctness of the results. Further than this, in view of the importance of this question and the many sources of error, I have tested all joints and escapes in the instruments used, have employed anæsthetized and non-anæsthetized animals, and have even gone so far as to send for my friend, Dr. de Schweinitz, to come and bear witness to the result, and to examine all the appliances to see that no leak occurred. The following experiment, which is a sample of all the rest, may be of interest:

Dog; weight, 45 pounds; setter; full grown. (No ether.)

A.M.
11.05 Injected twenty cubic centimetres of air into left jugular vein in less than a second with a syringe.
11.15 No change in any way noticed, save that breathing may have been quickened for about one minute after injection. Is moving around room, perfectly happy and frisking about.

Next day.—In perfect health.
Seventh day.—In perfect health.

The following tracings of the effect of air so injected seem to be of sufficient interest to make their insertion here worth while. Two doses of air within a few seconds of each other are here seen to cause but a slight fall in pressure, which was at once recovered from, and a slight diminution of pulse-rate.

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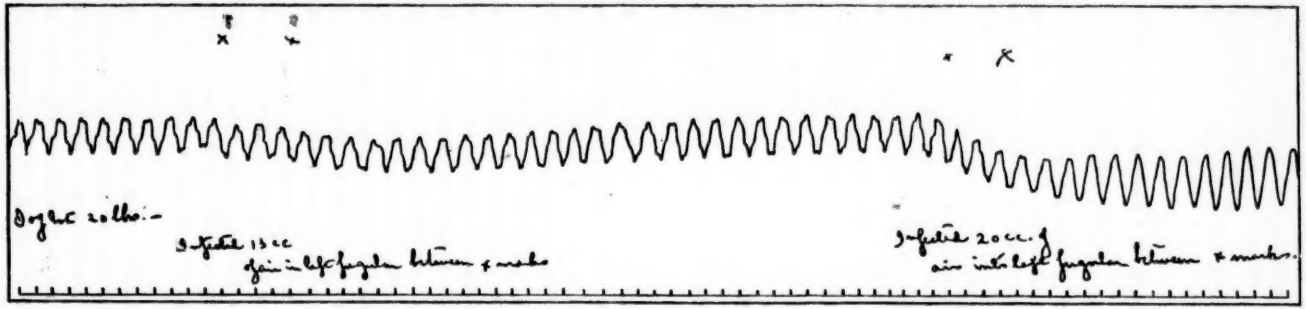
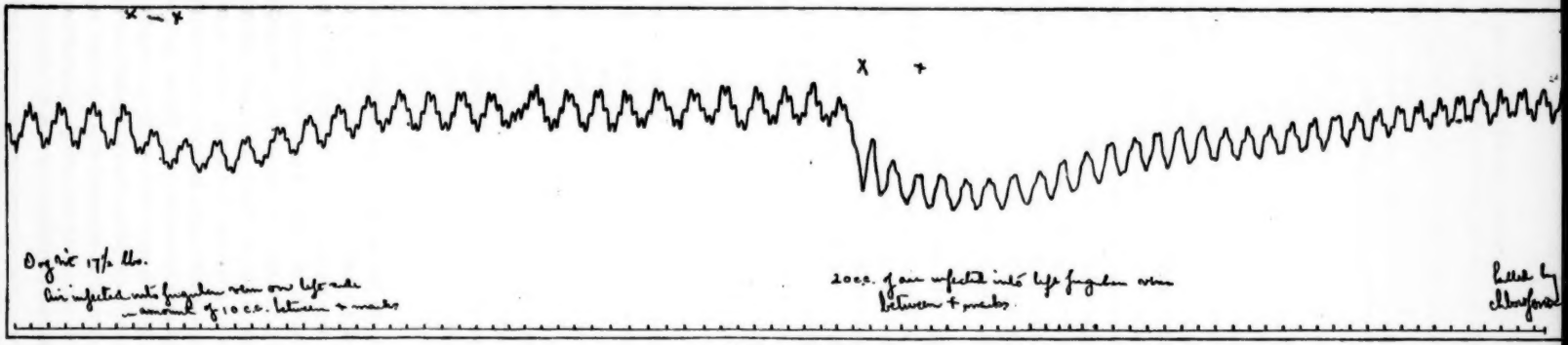
he is supported by Wilson Fox ("Diseases of Children," ii. p. 821), who considers "pepsin invaluable in gastralgia, and all irritative states of intestinal, stomach, and mucous membranes."

* Demonstrator of Therapeutics and Instructor in Physical Diagnosis in the Medical Department and in Physiology in the Biological Department of the University of Pennsylvania, and Physician to St. Agnes's Hospital.




Dog 2c 17½ lbs.
Air injected into jugular vein one left side
amount of 10 c.c. between 2 marks
20 c.c. of air injected into left jugular vein
between 2 marks.

(Reduced one-half.)

These are the results reached from the entrance of air into the jugular vein, in every quantity up to far above any amount which may enter because of a wound; and I shall therefore turn to the effect of the entrance of air into the carotid artery. Under such circumstances the results are quite different from those seen after opening of the jugular vein, but, nevertheless, totally disprove the theory that it is by cardiac failure that death under such circumstances occurs.

When air in as large an amount as twenty cubic centimetres is injected into the carotid artery, in from one-half to one second, respiration ceases at once, unconsciousness asserts itself, and the animal is apparently dead, save for the action of the heart, which keeps on as if nothing had occurred. In a moment respirations are renewed, the breathing becomes at first more powerful, then less and less so till death really ensues,—a result which can be indefinitely postponed provided artificial respiration is kept up. Sometimes the animal begins to breath voluntarily and lives independently of any such aid; in others he dies at once when the artificial respiration ceases. The two following experiments show these points very clearly:

Dog; weight, 40 pounds; mongrel spaniel; full grown. (Ether given while artery was secured.)

P.M.

3.40 Injected forty cubic centimetres of air into right carotid artery.
Animal at once stopped breathing and became unconscious.

3.41 Artificial respiration with hands compressing chest.

3.43 Voluntary respiratory movements.

3.44 Respiration has ceased; renewed artificial respiration.

3.46 Breathing voluntarily again; consciousness complete; some opisthotonos; hind limbs seem paralyzed; fore limbs intact; pupils of eyes and eyelids react normally to light and touch.

3.50 Respiration, 40 per minute.

3.55 Same state; howls every few minutes; tries to rise.

5.00 Same state, except opisthotonos is gone; hind limbs still palsied.

5.20 No change; killed by chloroform.

Dog; weight, 42½ pounds; hound; full grown.

P.M.

4.10 Injected twenty cubic centimetres of air into right carotid artery in one second.
Animal at once became comatose and ceased breathing; heart going well. Artificial respiration kept him alive for twenty minutes, when he died solely because compressing chest did not give him quite enough air. There was not a single sign of opisthotonos or palsy in this dog.

There are several interesting points in these two studies. First, the fact that air entering the carotid seems productive of the most serious consequences, while air entering the jugular vein does not; and, second, that the dose of twenty cubic centimetres of air proved as hurtful as did forty cubic centimetres. The same result as to the influence of air in the carotid artery was stated to be the case many years ago by the senior Professor Gross.

Having given the results as reached by me in these studies, it may not be out of place to sum up briefly the evidence we possess of an affirmative nature in regard to the matter in hand.

One of the most thorough studies of the subject so far published is undoubtedly that of Wattmann,* from whom most of the following information is derived unless otherwise stated. The first experiments of this kind are attributed to Wepfer, who is said to have killed an ox of stupendous size by blowing air with his mouth into its jugular vein,† while Redi, in a letter to Steno, written over two hundred years ago, stated that he had killed in a similar manner two dogs, a horse, a sheep, and two foxes. Similar studies have also been made by Heyde and Brunner. Ruysch, Valsalva, Morgagni, and others have at autopsies recorded the appearance of quantities of gaseous fluid in the vascular system which they believed to be air. Very much later Bichat‡ made startling announcements as to the small amount of air required to cause death when so introduced, but Nysten,§ a few years later, showed the fallacies in Bichat's assertions.

In 1818 a patient of Beauchêne, at the Hôpital Saint-Antoine, while he was extirpating a tumor of the right shoulder and lateral and lower part of the neck, died very suddenly "under circumstances which made him believe that this was occasioned by entrance of air into the vascular system through an opening in a vein." Further cases have since been reported by writers in this country, and abroad by Amussat,‖ Mott, and others.¶

* "Sicheres Heilverfahren bei dem schnell gefährlicher Lufteintritt in die Venen und dessen gerichtsarztliche Wichtigkeit," Wein., 1843.

† Morgagni, "De Sedibus et Causis Morborum," epist. v.

‡ "Recherches Physiologiques sur la Vie et la Mort."

§ "Recherches de Physiologie et de Chimie Pathologique," 1811.

‖ "Archives Gén. de Médecine," tome i., 3d series, p. 112.

¶ "Medical and Surgical History of the British Army in the Crimea, 1854–56," vol. ii.

The paper of Amussat is one of the most exhaustive of its kind, but its conclusions were vehemently attacked by men no less noted than Velpeau,* Gerdy, Blandin, and Mallé, all of whom asserted that the symptoms detailed were not to be thought due to the entrance of air, but to other extraneous causes.

In the experiments of nearly all the early investigators the air was introduced by blowing with the mouth or a syringe, but Amussat carried out a series of studies in which he opened the jugular vein and allowed any air to enter that could do so.†

The experiments in England have been very imperfect as compared with those in France, the best contributions being those of Erichsen.‡

In America, so far as I am aware, no studies have been made up to this time; and while the general opinion is at present against my results, I am glad to say that a very great deal of support and endorsement can be obtained for them,—not from those who have had no sure evidence to base their assertions upon, but from the men who, from a practical and experimental stand-point, are best qualified to give opinions. I shall, however, in justice to the subject before us, give the evidence upon both sides of the question.

The experiments of Nysten§ proved that only large amounts of air produce fatal results, the quantity varying from forty to one hundred and twenty cubic centimetres, according to the size of the dog, and he also found that larger amounts must be used to kill the ox or horse.

Magendie states that he has thrown, with all the force and celerity of which he was capable, forty or fifty pints of air into the veins of a very old horse without his dying immediately, and Cormack‖ blew the contents of his chest, twice filled, into the jugular vein of a horse before the animal exhibited any signs of uneasiness. Barthelemy has also found that in six horses, weakened greatly by the withdrawal of blood, as much as from four to six litres of air must be introduced intravenously to cause death, and estimates, in consequence, that a man weighing one hundred and thirty-six pounds would be killed only by two-thirds of a litre. Even the experiments of Amussat force him to the conclusion that a considerable quantity of air must be used to cause death. Oré¶ finds eighty cubic centimetres necessary to cause death in the dog.

The conclusions to be reached, therefore, from all experimental researches is that enormous amounts of air must enter a vein to cause death, and that no such quantity can possibly find its way into a vein which has been injured with the knife of the surgeon. These are the facts *against* the prevailing idea; let us see what the facts are *for* it. The answer is that there are none. While we have a large number of cases reported of sudden death under operations where veins were opened, in the majority of them the cause of death has been guessed at and not proved. The only case which approaches in any way towards authenticity is that of Mott, who saw a serious but not fatal result induced by the entrance of air into the facial vein, and even this is not a proved case. The case of Barlow** is equally doubtful as to the real cause of death.

There are a number of cases on record where death has resulted, according to the physician in charge, from the entrance of air into the uterine sinuses. These I have not room for here, and they are somewhat different in their character,—in that the character of the accidents and the peculiar anatomical arrangement of these veins render the entrance of large amounts of air more easy of accomplishment.

Supposing that ordinary atmospheric air is really capable of acting in the manner generally thought, the question arises as to the method of its influence. Erichsen believes it to be due to the frothy state of the blood, which prevents the due transfer of the circulating fluid through the pulmonary tissue, and Bell believed death to be due to the transferrence of air to the base of the brain.

Cormack has thought death to be due to gaseous distention of the heart, and Moore thought it to be due to the entrance of air into the cardiac cavities. Other observers have found air in the right heart, and concluded that in this way the blood is prevented from eventually getting to the lungs and general system. Again, it has been thought that the air prevents the closure of the valves of the heart or that the bubbles of air entering the smaller capillaries acted as emboli.

* *Gazette Médicale de Paris*, February 2, 1838.

† "Recherches sur l'Introduction Accidentelle de l'Air dans le Veins."

‡ *Edinburgh Med. and Surg. Journal* for January, 1844.

§ *Loc. cit.*

‖ "Prize Thesis," August, 1837.

¶ *Gazette Hebdomadaire*, 1863, p.33.

** *Medico-Chirurgical Trans.*, xvi., Part I.

Taking up the last theory first, we find, in the first place, there is no evidence whatever to prove that air may not be driven anywhere that blood can flow, and it is, to say the least, curious that any one should suppose that a bubble of air, which is compressible in itself and capable of assuming any form under pressure, should form an impassable barrier against which a blood-pressure of two hundred millimetres could press in vain,—a pressure made up of blood, a virtually incompressible body. This seems to be sufficient evidence of the falsity of any such theory.

Again, why should the air in the cavities of the heart prevent the valves from closing? We are accustomed to test the tightness of rubber bags by inflating them with air or water, and if the valves can close on a current of blood, why can they not do so upon a current of blood and air mixed? If air was as heavy as mercury, and as difficult of propulsion, such a theory might stand.

Even the theories of the causes of the supposed deaths in man do not, therefore, stand before a rigid examination, which is hardly to be wondered at when we have proved that the quantity of air entering the veins under such circumstances cannot be of any great quantity.

According to Ashhurst and Agnew, the veins of the neck are the ones most liable to be entered by air, and it is said by Agnew that the frequency of this accident is due to the fact that the venous trunks in that region are in many places attached to the deep fascia, which prevents collapse of their walls when wounded; for this reason this part of the body is spoken of as the "dangerous region," according to Ashhurst.

The explanation of the method by which the air finds entrance to the veins is supposed to be by a process of suction produced by the expansile movements of the chest in inspiration. Practically, most surgeons will agree with me in stating that generally the blood-pressure in the jugular vein is sufficient to cause so great a hemorrhage as to prevent any air entering the vein; and I have proved the fallacy of the suction theory any number of times by leaving an open canula in the jugular vein, the vessel being tied above to prevent hemorrhage.

It still remains to be explained why air injected into the jugular vein is not followed, unless in excess, by bad symptoms, while the same doses kill when sent into the carotid artery. I confess that any explanation I can offer is but a hypothesis. My theory is that the air in small amount on entering the right side of the heart is, when sent through the pulmonary blood-vessels, expired with the rest of the gases therein contained; and it is only when so large an amount is injected that some of it reaches the left side of the heart that death ensues, owing to the formation of minute clots which act as emboli. That such clots are not formed in the jugular vein seems probable from the results reached and from the fact that venous blood coagulates more slowly than arterial blood. The injection of large amounts of air into the carotid where arterial blood is present may cause clots and resulting emboli,—a theory still further supported by the symptoms of paralysis or spasm shown by the animals used. It can hardly be supposed that air is a poison in itself to the brain and its centres, particularly the respiratory centre.

Conclusions.—1. Death never occurs from the entrance of air into the ordinary veins of the body unless the quantity be enormous,—from one to several pints, a quantity which cannot enter unless deliberately sent in by the surgeon.

2. The cases on record have been due to other causes than air and have not been proved.

3. The tendency of the vessel to collapse and the leakage of blood prevent any entrance of air, and it would seem probable that a clot has generally caused death, not the air itself.

BROMIDE OF POTASSIUM AS AN ANTIDOTE TO IODOFORM.

A case of resection of a carcinomatous rectum is referred to in the *Wiener Medizinische Blätter* for July 11, 1889, in which symptoms of poisoning were produced through the use of iodoform. Under the use of bromide of potassium rapid relief was obtained. This condition is explained by SAMTER and RETZLAFF as due to the fact that bromide of potassium exceeds all other salts in its power for dissolving iodine compounds. They state that if a test-tube be half filled with a solution of potassium bromide (1 to 3), fifty drops of tincture of iodine may be added without the iodine being displaced from its solution with the potassium bromide. This condition persists for several days, and bromide of potassium, of all the different salts recommended in iodoform-poisoning, is the only one which is capable of retaining the iodine in permanent solution.

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EDITED BY
HORATIO C. WOOD, M.D.,
AND
ROBERT MEADE SMITH, M.D.,
PHILADELPHIA.

GEO. S. DAVIS,
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Leading Articles.

CHLORALAMIDE—A NEW HYPNOTIC.

IT is usually the case that most diseases for whose cure we find a long list of remedies recommended are practically incurable, and it may ordinarily be safely assumed that no one of the remedies recommended possesses any extraordinary value. If we may apply this argument to the treatment of symptoms, insomnia should be the most rebellious of all affections, for the list of hypnotics is already a superlatively long one, and is continually receiving new additions.

Yet it is a well-known fact that in individual cases nearly all hypnotics may fail. One patient may be put to sleep by cold applications on the neck, another must have chloral, and still a third, as has been suggested in the *Wiener Medizinische Blätter* for August 1, 1889, may be put to sleep by "suggestion," while, finally, in another case, every means will fail.

The last addition to the list of medicinal hypnotics is chloralamide,—a combination of chloral and formamide. This substance is described by Dr. Rabow in the *Centralblatt für Nervenheilkunde*, August 1, 1889, as possessing the formula of

$$CCl_3CH<^{OH}_{NHCHO},$$

and occurs in colorless, odorless crystals, which have a faintly bitter taste, and which mêlt at 115° C. It is soluble in 10 parts of cold water and 1 part of absolute alcohol. It is more readily soluble in warm water, yet the temperature must not be raised above 140° F., since at this point separation of the two components readily occurs. Weak acids or nitrate of silver have no effect upon this solution; while, on the other hand, it is decomposed by caustic alkalies and alkaline carbonates.

The name chloralamide is by no means a satisfactory one, since the substance is a chemical compound of chloral and formamide, and should, therefore, be described as a chloral formamide or as formidate of chloral.

Professor Rabow states that numerous experiments on animals and men proved that this remedy, in doses of from 15 to 60 grains, is capable of producing sleep, and although sleep does not follow its administration as soon as after the use of chloral hydrate, it yet appears much earlier than after the use of sulphonal.

The writer claims that he has never observed any unfavorable influence of this substance on the digestive organs, but he states that he does not feel warranted in giving any opinion as to its action on the circulation, leaving that to be determined by subsequent study. He claims, however, that the uncomfortable and prolonged after-working of sulphonal is not produced by chloralamide, while its solubility is a further recommendation of the latter.

The doses which he administered varied between 15 and 60 grains, given in the form of a powder, in capsules or dissolved in wine or beer, recommending as the best means of administration that it be given in tea or mulled wine.

To produce satisfactory sleep chloralamide must be given in somewhat larger doses than chloral hydrate, 45 grains of the former corresponding to about 30 grains of the latter. In the author's experiments, sleep followed within twenty-five to thirty minutes after its administration, and lasted from six to eight hours.

Dr. Rabow has found that in doses of from 45 to 60 grains it is quite useless in mania or cases of maniacal excitement; while, on the other hand, it has proved highly reliable in the nervous insomnia of neurasthenia and hys-

teria, and in sleeplessness from alcoholic excesses.

He has employed it in fifty-two different instances, in but few of which was any failure noted; no disagreeable effects were in his experience ever produced.

Dr. Hagen and Dr. Hüfler, assistants in the medical clinic in Erlangen, have also brought forward a number of observations on the use of formamide (*Pharmaceutische Post* for August 8, 1889), in which they confirmed the favorable opinions given above. They employed it in doses of 30 to 45 grains, and found it especially efficacious in cases of insomnia depending upon nervousness, and, in fact, most cases of sleeplessness which do not depend upon pain. These authors report in the *Wiener Medizinische Blätter* for August 1, 1889, that they have experimented on twenty-five patients and three healthy individuals, giving in all one hundred and eighteen doses.

Sleep was produced in twenty-six cases, and only failed in two, of which one was a case of paralytic dementia and the other an advanced case of phthisis. Comparing chloralamide with chloral, the authors give the impression of preferring chloralamide to chloral on account of freedom from taste, greater efficiency in producing sleep, and freedom from dangerous or disagreeable after-effects, although in some cases a slight headache remained on awakening from sleep. The chloralamide seemed incapable of subduing pain, although in cases of cardiac asthma it seemed to act almost as a specific.

In Professor Strumpell's clinic 30 grains were generally found sufficient, especially in women, although occasionally 45 grains were required, given in capsules or dissolved in wine. No disagreeable effects on the heart, respiration, temperature, digestion, or kidneys were ever noticed.

In the *Deutsche Medizinische Wochenschrift*, August 1, 1889, Dr. Reichmann likewise publishes a paper on the use of chloralamide. Dr. Reichmann commenced his investigations by the administration of 45 grains to a medium-sized dog, and although the dog seemed somnolent no actual sleep was produced, and no effects of any kind were noted. But although this experiment gave an absolutely negative result, he states that his experiments have shown him, on the other hand, that chloralamide is a reliable and active hypnotic, and entirely free from any unpleasant after-effects. He commenced with the administration of 15 grains, and extended the dose until 45 grains were administered, and obtained a much better result with the latter amount. Contrary to what has been experienced by others who have studied this drug, Dr. Reichmann states that he has even found chloralamide will produce sleep where pain may be the cause of the insomnia, and he refers to the cause of a woman suffering with colic from gall-stone, where sleep was produced by 45 grains of chloralamide.

This also occurred, as a consequence of a dose of 60 grains, in the case of a lady suffering from violent neuralgia, even though the patient was addicted to the use of morphine. The author has likewise studied the influence of chloralamide on the circulation by means of the sphygmograph, and found it was entirely free from any undesirable effects.

In the *Deutsche Medizinische Wochenschrift* for August 8, 1889, Dr. Peiper likewise publishes a paper on the use of chloralamide, giving notes of twenty-four cases in which it was used as a hypnotic, administered in the form of a powder, followed by milk or weak coffee.

In four cases it was given as an enema, and the latter mode of application was found very satisfactory, no irritation being produced even from frequent repetition, although its action was somewhat slower than when given by the mouth.

Dr. Peiper likewise found that in nearly all cases 30 to 45 grains were quite sufficient to produce sleep, and in one case, that of a child 11 years old, sound sleep for more than three hours resulted from a dose of 7 grains. Sleep generally occurred in one-half to three-quarters of an hour, and persisted for seven to eight hours. On the next morning these patients complained of great fatigue and desire for sleep, as a consequence of a dose of 45 grains each. Three patients complained of headache the next day and one of dizziness, while no effects of any kind were noticed on the pulse, respiration, or temperature, although they complained of more thirst than usual on awakening.

Dr. Peiper likewise found that the effects were most satisfactory when given in insomnia from nervous affections, and believes that its action was more marked than that of chloral.

The opinions, therefore, of a number of separate observers seem to indicate that chloralamide promises to be a valuable addition to our list of new drugs. The unusual part of the testimony, which has so far been offered, is that so many different observers should simultaneously experiment with an entirely new drug, since we find that all the papers alluded

to above are published within one week of each other. This is, perhaps, explained by the fact that the drug is introduced by a German manufacturing chemist at the suggestion of Professor von Mering, and we infer from that that chloralamide, like a number of other drugs of similar source, is protected by a patent. We have no means as yet of averring that positively, but the manner of the introduction leaves little doubt as to the accuracy of our supposition. That being the case, we would require more independent observation before giving any opinion as to the actual value of chloralamide.

HYPNOTISM.

THE subject of hypnotism and its therapeutic employment has attracted so much more attention upon the continent of Europe than in North America that it seems necessary in writing concerning it for the general American reader to make certain fundamental statements, which are to those versed in the matter very trite. First, it is certain that the facts of hypnotism are really facts,—*i.e.*, it is sure that by very simple processes most individuals, at least of some races and many individuals of all races, can be thrown into a condition of perverted consciousness, in which they are automatisms, controlled by the will of the operator,—insensitive in such portions of the body as he declares are devoid of feeling, sensitive when he declares sensation exists,—physically, morally, seemingly in all respects an *alter ego* to the man who commands them. Second, it seems indisputable that relief, if not cure, has been obtained in cases of disease by means of hypnotism. The scope of the present journal naturally leads us to confine our attention to considerations connected with the last proposition.

As long ago as 1866, Tiebault, of Nancy, published the first book discussing the treatment of disease by hypnotism, but it was not until the attention of Professor Bernheim was attracted to the subject that the importance of the steady, persistent, clinical work of Tiebault received recognition. Professor Bernheim's book appeared in 1884, and to-day almost every large city of Europe has one or more clinicians devoted exclusively to the practice of the system inaugurated by Tiebault, while the literature of the subject would fill several book-shelves.

The method of treatment is simply by suggestions made during the hypnotic state. Take, as an example, a case of painful menstruation in a neurotic patient. Once or twice, a few days before the menstrual period, the woman is put to sleep, the hypnotism being carried not further than the deepest condition of the first stage,—*i.e.*, that of catalepsy. Then she is told, in a moderate but very commanding tone of voice, you will not have any pain at your next period. "No pain at your next period" is repeated half a dozen or more times, and, after sleeping a few minutes longer, the patient is wakened. It is affirmed that it is much preferable that the sleep be so performed that the woman has no remembrance of what has been done. As the writer of this editorial has seen, by this simple management, without the aid of any other moral, physical, or medicinal treatment, a woman who has been accustomed to be disabled one or two days during each month is enabled to pass through menstrual period after menstrual period without suffering.

Especially by Tiebault, Bernheim, and Beaunis, of Nancy, the hypnotic method of treatment has been used with asserted almost miraculous results in a great variety of chronic disease. Rheumatism, gout, chronic constipation, diarrhœa, general debility, are affirmed often to yield to the process. It is "extremely useful in cramp from the overuse of certain muscles" (writers', telegraphers', etc., cramp), and "is very successful also in cases of old-standing paralysis, and especially so in the infantile variety." Professor Delbœuf, of Liege, made upon each of the two arms of a man a similar burn with caustic, told him, while hypnotized, that one would heal with suppuration, one without, and so it happened. Focachon has blistered severely with postage-stamps, backed up by hypnotic suggestion; the deaf have been made to hear; the immoral have been reformed; bad children made good; and Tiebault even believes, although his experiments have not yet been brought to a satisfactory conclusion, that by hypnotizing and suggesting to the pregnant woman the fœtus can be physically educated in the uterus, and indefinitely hurried forward towards Apollo-like beauty and Minerva-rivalling wisdom. If the assertions of devotees of hypnotism can be made good, if their predictions shall be fulfilled, Christianity, as a reforming, perfecting force, will pale utterly before the power of a bright button.

However much we may be inclined to doubt, it must be acknowledged that wonderful things have been done. The writer saw at Professor Luy's service at La Charité a man in

whose case the diagnosis of paralysis agitans had been made—who certainly for four years had been so tremulous that he was unable to feed himself or perform the ordinary acts of life—cured by hypnotism so as to be able to run in and out through the wheels of carriages about the Paris Exposition selling tickets; that this was, however, truly a case of true paralysis agitans the writer does not believe, the whole appearance of the patient suggesting a hysterical mockery rather than a true sample of the hitherto uncurable disorder.

The rapid spread of the system and the results said to be achieved, certainly require that American physicians shall make for themselves clinical studies; although it is true that in Charcot's clinic at the Salpêtrière, after trial, hypnotism has been abandoned as a therapeutic measure, and that at Vienna Meynert refuses to employ it because, as he says, it weakens the will of the hypnotized person, whereas what is desirable in neurotic subjects is to strengthen the will. There are also other lions in the path. The deeply hypnotized subject is so thoroughly under the control of the operator that he or she can be made to permit or commit criminal acts, and in Holland and Switzerland the law has already forbidden the public exposition of the hypnotic state. There are very few persons who can be put to sleep without their own active, or rather passive, co-operation, but it is probable that, after a long course of hypnotism, the operator may gain almost complete control over the subject. At any rate, it should be an absolute rule that under no circumstances should the medical practitioner induce hypnotism, except after the full consent of the subject and in the presence of a third person.

Most, if not all, of the advocates of hypnotic therapeutics teach that the state has no relations with hysteria, and that the therapeutic results are the direct effect of the suggestions made by the operator, and are best obtained where the subject has no knowledge of what has been said. They believe that the nervous system is thrown into such a condition that impulses coming from the suggestions made by the operator have an effect upon trophic and circulatory nerves much more powerful than can occur during the normal state. Charcot, however, is probably correct in asserting the very close relation between hypnotism and hysteria, and it does not yet seem necessary to believe that the cases have been affected by the words of the operator acting without the knowledge of the patient. Take the case of the woman spoken of early in this editorial. She had no remembrance of what had been said to her during the hypnotic sleep, but she knew that she came to the doctor to be cured of her menstrual pains, and that some most mysterious and, to her mind, all-powerful series of acts had been performed upon her for the purpose of curing her. This certainly was a sufficient basis for a cure produced by a mental impression. In other words, it seems still possible to believe, or, at least, it does not yet appear to be disproven, that hypnotism, like the magnet, the metallic tractors, metallotherapy, etc., is simply a means of powerfully impressing neurotic subjects by acting upon their conscious mentality, and thereby influencing the lower nervous system. Of all known plans for therapeutically appealing to the imagination and for impressing patients, hypnotism seems to be the most powerful. A more uncanny sight than a room full of people sleeping, contorting, marching, etc., at the will of one man it is not often given mortals to see.

HYDROXYLAMINE.

IN 1865 the chemist Lossen discovered a substance capable of forming salts, and having the formula $2H_2O + NH_2OH$, to which he gave the name of hydroxylamine. The toxicological property of it and its salts was studied in 1888 by Professor Binz, who found that it produces in the lower animals stupor, convulsions, hæmaturia, and discoloration of the blood, the latter change being due to the formation not only of methæmoglobin, but also to the reduction of this substance in part to hæmatin. In his experiments the physiological action of the hydroxylamine so closely resembled that of pyrogallic acid, chrysarobin, anarobin, and allied substances, which have been found serviceable in the treatment of psoriasis, that he suggested its use in skin-affections.

The physiological action of hydroxylamine has during the present year been further studied by Professor L. Lewin, of Berlin, who has not added very much positive information to the results previously obtained, but has determined that it affects dead and living blood similarly, and that its action upon the corpuscle is probably due to its decomposition, and the liberation of nitric or nitrous acid.

The practical suggestion of Professor Binz has led to trials of the drug by the German

dermatologists, and especially to a careful study of it by John Fabry (*Archiv Dermat. et Syph.*, Heft ii., 1889). This clinician found that a ten per cent. solution is excessively irritant to almost all skins, causing intense redness, violent burning, sweating, and not rarely blistering the part. Some skins will not bear a one per cent. solution, so that it is not safe in a new case to begin with a stronger application. The solution should be gradually increased, and be applied at intervals of one, two, or three days, according to its effects. In the cases studied by Fabry, the results were most favorable. One very severe example of chronic psoriasis, which had resisted other treatment, had the ordinary solution of pyrogallic acid applied to one arm, to the other the solution of hydroxylamine. At first the arm treated with the acid appeared to improve most rapidly, but in a few days the other arm overtook and passed it on the road to recovery, and was well some time before the other.

Two formulæ have been used by Fabry, the one spirituous, the other aqueous.

Hydroxylamine muriate, 2 to 5 parts;
Alcohol, 100 parts;
Chalk, sufficient to neutralize.
Mix and filter.

Hydroxylamine muriate, 1 part;
Water, 1000 parts;
Chalk, sufficient to neutralize.
Mix and filter.

The great advantage which hydroxylamine has over pyrogallic acid, anarobin, chrysarobin, and other previously used substances is, that while the latter always deeply stain the skin, it is entirely free from color and from dyeing properties.

THYROIDECTOMY.

GOITRE is such a rare disease in the United States that the subject of its operative treatment is of but little practical importance for most of our readers. Nevertheless, the results obtained are so mysterious that perhaps a few words concerning them, as at present illustrated in the wards of Professor Theodor Kocher, of the University of Berne, may not be devoid of interest. As is well known in the great majority of cases, myxœdematous diseases, after a time, follow the complete removal of the gland. This Professor Kocher has found may be avoided by leaving in the neck one lobe, or even part of a lobe, of the gland. By means of careful antiseptics the operation is so robbed of its terrors that we have seen a patient four days after it entirely well, the wound being completely healed.

A very bold experimental operation for the relief of the myxœdema, which has followed complete removal of the gland, is now under trial. It consists in inserting a fresh, healthy piece of the gland in the abdominal cavity, with the hope that it may form attachments and perform its mysterious function. In one case, probably by pressure upon the large intestines, the inserted mass, after the complete healing of the wound, caused such violent colicky attacks that it had to be removed, but in most instances no evil effects have followed the insertion. What becomes of the transplanted gland is not yet known. A case was recently shown us that had been operated upon about three months previously, in which the presence of the gland in the abdomen could apparently be still demonstrated by palpation, etc., and in which, the patient asserted, his general condition was much better than before the abdominal section. It will be a very strange physiological fact if it should be found that the transplanted gland has the power of taking root and adapting itself to its new environments. It is, perhaps, allowable to add that the glandular masses for transplantation have been taken from the necks of individuals with hypertrophied thyroids.

CORONILLA—A NEW HEART REMEDY.

CORONILLA SCORPIOIDES, the annual plant from which this remedy is obtained, belongs to the family Papilionaceæ, suborder Coronillæ, and is widely distributed through the southern parts of France. From experiments made on animals, Dr. Cardot has determined that the coronilla arrests the heart of the frog in systole, and in his inaugural thesis sustained in Nancy in 1886 he refers to four cases in which this remedy had produced considerable amelioration in various cardiac affections.

Dr. Cardot's statements, however, attracted but little attention until recently Schlagdenhauffen and Gley and Spillman have again called attention to this subject in papers read before the Société de Biologie, while finally, quite recently, Schlagdenhauffen and Reeb (*Revue Générale de Clinique et de Thérapeutique*, July 25, 1889) state that they have isolated a glucoside from the coronilla, which they term

coronillin, of which the toxic dose would amount to ¾ of a grain for a man weighing about one hundred and twenty pounds.

Nevertheless, the authors maintain that to produce any therapeutic effect, 2 to 3 grains must be administered, or from 9 to 22 grains of the extract. The remedy is stated to act especially on the myocardium, whose contractility it increases.

Dr. Spillman has employed it in seventeen cases of heart-disease, administering it in the asystolic period. In eight cases the remedy is stated to have produced satisfactory results, in two cases it produced very slight amelioration, and in seven cases its therapeutic action was entirely negative. A diuretic effect was frequently observed, the amount of urine evacuated daily increasing in a few days from seven ounces to two to four quarts.

Coronilla is stated to act but feebly on the number and rhythm of the cardiac pulsation, but it is claimed to produce an increase in the amplitude of the pulse and augmentation of the diuresis, and diminution of œdema and improvement in the respiration.

In Dr. Spillman's case the remedy was administered for three or four days in succession, and the therapeutic effect was only perceptible after twenty-four to thirty-six hours after the administration of the first dose.

It appears that whatever good effects may be obtained from the use of this remedy, they are of the most transient character, since it is stated that twenty-four hours after the cessation of the use of this drug the patient's condition returns to its original state.

The value of the remedy is thus highly problematical, especially when we take into consideration, that while Schlagdenhauffen states that ¾ of a grain is a poisonous dose, that Dr. Spillman should, nevertheless, recommend the administration of from 3 to 5 grains.

Evidently further studies are required before any definite opinion can be expressed as to the value of this one of the most recently recommended remedies.

Reports on Therapeutic Progress.

INTESTINAL SURGERY.

Assisted by Mr. Victor Horsley, MR. FREDERICK B. JESSETT made an experimental investigation into the operative procedures suggested by Dr. Senn (*British Medical Journal*, July 27, 1889). His results confirmed Dr. Senn's conclusions, and show that there is no fear of any fæcal accumulation forming in the excluded portion of intestine, and that the treatment of intestinal obstruction by anastomosis must in the future be the recognized operation in the majority of, if not in all, cases of obstruction of the bowel, which cannot be overcome otherwise than by opening the gut.

The idea of establishing a fistulous communication between a portion of bowel above and below the seat of an obstruction originated with Maisonneuve, who operated on two patients, but with fatal results in both instances. The operation met with violent opposition at the Surgical Society of Paris, surgeons assuming that the excluded portion of intestine would become the seat of fæcal accumulations, which would ultimately destroy the life of the patient, even if he survived the operation. In the year 1863, Hacken, under the direction of Adelmann, made some experiments on dogs, but with no success; and the subject seems to have been completely forgotten until E. Hahn, of Berlin, drew attention to it again in commenting on his two cases of excision of the colon, when circular enterorrhaphy could not be performed, and an artificial anus was established. Both his patients recovered from the operation, but all attempts to close the preternatural opening proved futile.

The four modes of operating as suggested by Dr. Senn—that is, 1, gastro-enterostomy; 2, jejuno-ileostomy and ileo-ileostomy; 3, enterorrhaphy; 4, ileo-colostomy—are described by Mr. Jessett as follows: Gastro-enterostomy and jejuno-ileostomy are performed identically in the same way by means of decalcified bone plates. They should have an oval opening in the centre three-quarters of an inch long by half an inch in width. To decalcify them, let them be placed in a ten per cent. solution of strong hydrochloric acid, and allow them to remain in this until they are quite soft and pliable; the acid solution requires to be changed about every second day, and usually the plates are thoroughly decalcified in the course of a week. They are then washed, and allowed to lie in plain water for some hours to get rid of the superfluous acid, and finally they are preserved in rectified spirit until required for use, when they should be placed in a twenty per cent. solution of carbolic acid for an hour before using them. In preparing these plates for operative purposes, four holes have to be drilled in them close to the edge of the cen-

tral oval opening,—namely, one on either side and one at each end. Through these openings four threads at least twelve inches long of No. 1 chromicized catgut or Chinese silk, each armed with a fine sewing-needle, are passed and fastened to a circular thread at the back, of the same material, which is formed so as to be a trifle larger than the oval opening. The plates being now ready for use are placed in a solution of carbolic acid.

Gastro-enterostomy.—In performing this operation, an opening some three inches in length is made in the middle line of the abdomen, between the ensiform cartilage and umbilicus, the omentum being pushed on one side; a piece of jejunum, as near to its origin as practicable, is drawn into the wound and held by an assistant; a portion of the stomach, about two inches from the greater curvature and as near to the pyloric end as possible, is also drawn into the wound. Two pieces of india-rubber tubing are next passed through the mesentery, about four inches apart, one on either side of the portion of gut to be opened, and, after this has been emptied of its contents by gently squeezing it, these india-rubber tubes are fastened sufficiently tightly to prevent the contents passing.

The portion of the stomach and intestine being now well outside of the wound, are packed round with sponges to catch any of their contents that might escape on their being opened. An opening about an inch in length is now made in a longitudinal direction into the convex surface of the jejunum, and one of the bone plates slipped in; the needles of the two lateral threads are then passed through all the coats of the bowel close to the cut edge, and unthreaded, the two end threads being brought out at either end of the wound in the gut; these threads are then given to an assistant to hold, while the surgeon makes another incision into the stomach parallel to the greater curvature; the other bone plate is then passed into this viscus through the incision, the needles of the lateral threads are passed through all the coats of the stomach, the end threads being, as in the jejunum, brought out through the wound.

The two openings are next accurately adapted to each other, and the bone plates held firmly in position by an assistant while the surgeon ties the corresponding threads of either plate tightly. The lower lateral threads should be tied first, then the end ones, and finally the upper lateral. Should the ends of the bone plates be found to tilt, it is wiser to insert a Lembert suture at each end, but this is not always necessary. The jejunum being now firmly fixed to the stomach, the parts are dropped back into the abdominal cavity, the toilet of the omentum attended to, and the abdominal wound closed in the usual manner. This operation may be readily performed in from fifteen to twenty minutes, and was successfully accomplished on two dogs by Mr. Jessett and Mr. Horsley, both of which made uninterrupted recovery, never having displayed the slightest pain or inconvenience.

Jejuno-ileostomy.—If it is not desired to remove any portion of the diseased intestine, but simply to form an artificial communication between a portion of intestine above an obstruction and another portion below, the operation is conducted exactly in the same manner as that described for gastro-enterostomy. Should it, however, be deemed necessary to excise a portion of the gut, the operation will have to be modified somewhat. In this case, the intestine, being drawn well out of the abdominal wound, and gently squeezed at the seat of the operation, to empty it of its contents as far as possible, should be clamped, either by means of india-rubber bands or one of the numerous clamps devised for the purpose, about four inches on either side of the portion of diseased or injured bowel to be removed. Sponges should be carefully packed around the opening into the abdomen to prevent any fæcal matter that may escape from the divided intestine entering into the peritoneum, and the bowel cut directly across with scissors, and a V-shaped piece of mesentery also removed. All bleeding points being secured with fine catgut ligatures, the two ends of each portion of the bowel are to be invaginated into themselves, and, when invaginated to the extent of one inch, the serous and muscular coats of each are stitched together by means of a continuous catgut or Chinese silk suture. The two ends of the gut are next placed parallel to each other, with their convex surfaces in apposition. It is of importance to notice that the two portions of intestine are applied end on, so as not to interfere with the peristaltic action of the bowels. An opening about an inch long is made longitudinally in each portion of the gut on its convex surface, and the bone plates passed in and fastened in the same manner as already described for gastro-enterostomy. The divided mesentery is united by a few stitches of cat-

gut. This operation can be easily performed in twenty minutes.

The authors have performed this operation on dogs in six cases; in every case portions of the intestine varying in length from three to twelve inches were removed. All these dogs made an uninterrupted recovery.

Circular Enterorrhaphy.—This method, suggested by Senn and adopted in the investigations we are considering, is really a modification of Jobert's operation. In both operations, the proximal portion of the divided gut is invaginated into the distal end, and the sutures are passed through all the coats of the intestine, but Senn's operation differs from Jobert's in that he lines the upper end of the bowel with a soft pliable india-rubber band, which is cut the required length at the time of the operation, and formed into a ring by fastening the ends together with two catgut sutures. The rings that Mr. Jessett used were formed of a broad flat band of india-rubber, one-quarter to a half inch in depth; this is pushed into the lumen of the proximal end of the gut, which it should fit accurately. The ring is to be fastened to the lower end of the proximal portion of the bowel by a continuous catgut suture which prevents the bulging of the mucous membrane. Two chromicized catgut sutures about eighteen to twenty-four inches long and threaded at either end with an ordinary sewing-needle are next prepared, and the needle passed from within outward, transfixing the upper portion of the rubber ring and all the coats of the bowel. The posterior threads are passed one on either side of the mesentery, and the anterior needles at equal distances apart through the convex surfaces of the bowel.

The intestine above and below the seat of operation is either compressed between the thumb and fingers of an assistant, or by an india-rubber band passed round and lightly tied, or by one or other of the clamps made for this purpose.

The needles are next passed through the peritoneal and muscular coats of the lower portion of the intestine at corresponding points, about one-third or half an inch from the cut edge. An assistant now makes gentle traction upon all the threads, while the operator manipulates the two ends of the divided gut, so that the upper end becomes invaginated into the lower. Care must be taken that the margins of the lower end are turned completely and evenly in, so that the serous surface of the intussuscipiens is in close contact to that of the intussusceptum. The operator having satisfied himself that the upper portion of gut is completely invaginated, proceeds to tie the catgut sutures with sufficient firmness to prevent disinvagination.

The divided mesentery is next fastened together with a few interrupted catgut sutures, and great care should be paid to the mesenteric attachment of the gut at the point of operation, as it is here that the greatest difficulty is experienced in the invagination; in Mr. Jessett's experience it was always well to place a couple of Czerny-Lembert sutures, one on either side of the mesenteric attachment. After a few days the rubber ring becomes detached, by the absorption of the catgut sutures, and passes *per anum*.

The success of this operation can be greatly increased by applying either an omental flap or an omental graft around the seat of operation.

An omental flap, adopted by Senn and others, may be applied by cutting a strip of omentum about two inches wide and wrapping it round the gut, fastening it in place by a couple of stitches, one on either side of the point of union of the intestine, and passing through both surfaces of the flap and the mesentery, care being taken to insure that the sutures are passed parallel to the mesenteric vessels. The cut edge of the omentum from which the flap has been excised, after all bleeding points have been secured, should be united by a continuous catgut suture. In the case of an omental graft, a piece of omentum about two inches wide is entirely cut away of sufficient length to wrap easily round the bowel; this then being washed in a weak solution of carbolic acid is fastened round the seat of operation in the same manner as the flap, the cut omentum being united by a continous catgut suture. Dr. Weir, of New York, suggests that a peritoneal graft might be formed out of the mesentery which has been cut away.

In the seven cases in which this operation was performed the first two died from peritonitis due to leakage at the mesenteric attachment three days after the operation. In one of these the distal portion of intestine was invaginated into the proximal by accident. The third case died on the fourteenth day. In this case an omental flap was applied; at the post-mortem examination union of the gut was found to be perfect, as also of the omental flap, but the upper end of the bowel was filled with small pieces of hay, mixed with other food, which the animal had

eaten. This had formed a complete block. The india-rubber ring had disappeared, and on removal of the accumulation, the lumen of the gut was found to be perfect. The remaining four cases all recovered, although in the last one, in which the omental graft had been applied, the dog wasted considerably, and when killed two months after the operation it was discovered that the portion of the bowel above the seat of operation in this dog was also enormously distended and filled with pieces of hay and *débris*.

Mr. Jessett states that this operation is much more difficult in dogs than in human beings, and that he has performed it a number of times on the dead body with perfect ease, and in one case, that of removal of a sarcomatous ovary in which a large portion of small intestine was involved, he was obliged to remove some twelve inches of intestine by means of this operation. The patient did well for eight days, when she suddenly developed peritonitis, and died on the tenth day. In this case there had been ulceration along one of the sutures, which, in the author's opinion, teaches the desirability of using plain, not chromicized catgut sutures for stitching the ring to the margin of the bowel.

The operation of *ileo-colostomy* may be accomplished either by approximation plates, the same as described for jejuno-ileostomy, or by the following method:

The ileum being divided a short distance from its junction with the cæcum, and all bleeding points ligatured, the divided end of the lower portion of bowel is invaginated into itself and secured by a continuous catgut suture passing through the serous and muscular coats only. The upper portion, being held by an assistant or secured by an india-rubber ring or clamp to prevent the escape of its contents, is lined with a thin india-rubber ring and two long sutures armed at each end with a needle passed in a similar manner to that described for circular enterorrhaphy. Next a slit an inch in length, or sufficiently long to allow the portion of intestine to be implanted, is made on the convex surfaces of the ascending colon. The needles of the sutures connected with the small bowel are next passed through the perineal and muscular coats of the colon at either end of the opening and the small bowel inserted into the slit; the two sutures are next firmly tied to prevent the bowel slipping out, and it is as well to introduce two lateral Czerny-Lembert sutures, one on each side, between the small gut and colon. The operation, which is now completed, can be very quickly accomplished.

This operation was performed three times by the author, all making excellent recoveries.

Mr. Jessett then proceeds to analyze the operations as performed by Dr. Senn, and compare them with his own experience.

Gastro-Enterostomy.—Dr. Senn has reported five cases in which he performed the operation of gastro-enterostomy by means of decalcified bone plates. Three of these recovered without any bad symptoms and one died, the cause of death being attributed to the dog's stomach being full at the time of the operation. The omentum became soiled, and much of it was cut away. At the post-mortem one of the ligatures was found to have slipped, and hemorrhage ensued. In two cases operated on by Mr. V. Horsley and the author both recovered without bad symptoms.

In no case was any injury caused to the mucous membrane by the pressure of the plates.

In the second case, the jejunum was fastened to the posterior wall of the stomach by tearing through the gastro-colic omentum and transverse meso-colon, and drawing a portion of the jejunum through the meso-colic opening.

In the operation of jejuno-ileostomy performed by Dr. Senn, in seven cases the divided intestine was united by Czerny-Lembert sutures; five of the dogs died, three directly from the operation, and two from obstructions caused by enteroliths; the remaining two made good recoveries. Senn then operated on eight dogs by means of approximation plates; of these, seven recovered, and one died fourteen days after the operation, from the obstruction caused by the presence of an enterolith, the result of the dog eating his bed.

The five dogs operated on by Mr. V. Horsley and the author by means of approximation plates all recovered; and the one case in which the operation was performed by means of implantation of the upper segments into the lower, the dog died from hemorrhage due to the slipping of one of the ligatures on the third day.

These cases are very significant and instructive, for here we have fifteen cases operated on by Dr. Senn, exactly under the same circumstances, and, presumably, by the same operator, in seven of which the divided intestines were united by suturing the two ends

together by means of Czerny-Lembert sutures, and in the remaining eight the ends were united by approximation plates. Of the dogs operated on by the former method, five died, while in all of those operated on by means of the approximation plates, only one died, and that not directly from the operation, and this experience is fully confirmed by Mr. V. Horsley and Mr. Jessett, as in five cases operated on by them in which the ends of the intestines were united by approximation plates all recovered. Taking, then, into consideration the excessively low mortality of this operation when performed by approximation plates, the very short time the operation takes to perform,—namely, only about twenty minutes,—and comparing it with the results of the same operation carried out by suturing after Czerny-Lembert's method, which operation cannot be done under an hour and a half to two hours, there cannot be any question as to the value of the operation as proposed by Senn.

Enterorrhaphy by invagination is undoubtedly more difficult to perform than the operation by means of approximation plates, and the mortality after the operation is certainly larger. It will be noticed, however, by the report of cases performed by Mr. V. Horsley and Mr. Jessett, that the two factors play an important part in the success of the operation,—viz., first, practice; for out of the seven cases that were operated upon, it was the first two which died immediately from the effects of the operation; the third died from the bowel above the seat of operation being blocked by an accumulation of hay and *débris*, while the remaining four all recovered. The second factor is undoubtedly the use of the omental flap or graft, wrapped around the seat of operation.

Another point in this operation, as experience has taught, is that in all future cases on the human subject, the author would advise the use of ordinary catgut sutures for fastening the india-rubber ring to the end of the bowel, and also for passing through the coats of the intestines; and, finally, that three Chinese silk Czerny-Lembert sutures should be inserted to unite the two ends of the divided bowel, one on each side of the mesentery, and one in the convex surface of the intestine, to prevent the possibility of the bowel becoming disinvaginated.

The use of ordinary catgut sutures would prevent the possibility of the india-rubber ring being retained too long, and thus becoming a source of obstruction, and yet they would last a sufficiently long time to allow of plastic lymph being thrown out between the two approximated serous surfaces.

The author further points out that in all cases of obstruction there would be considerable difficulty in performing enterorrhaphy by invagination, as in such cases the proximal end of the bowel is of necessity greatly dilated, while the portion of the bowel below the obstruction is correspondingly contracted, so that the difficulty of invaginating the dilated into the contracted portion would be very great. This objection would not apply to union by means of approximation plates.

It will be seen, then, that in the nine operations reported by Dr. Senn, four were performed without an omental flap, three of which died. It is right to point out, however, that only one died directly from the operation, the other two dying one from the pressure of an enterolith eighty-one days after the operation, and the other from a faulty operation, the lower end of gut being invaginated into the upper by mistake. Of the remaining five operations, all had either an omental graft or flap; of these, only one died of perforation.

Of the seven operations performed by Mr. Horsley and Mr. Jessett, the two first died directly from the operation, the first from the lower portion of bowel being invaginated into the upper by mistake, and the third succumbed to obstruction caused by an enterolith, the result of the dog eating his bed, the remaining four making excellent recoveries.

Ileo-Colostomy.—Of this operation, Dr. Senn has reported sixteen cases, six of which were performed by implantation, the end of the ileum being lined with india-rubber band; of these, two died, one of septic peritonitis and the other of perforation; in seven dogs the operation was performed by lateral approximation, the two portions of gut being united by Czerny-Lembert sutures; of these, two died of septic peritonitis; in the remaining three the union of the ileum and colon was accomplished by means of approximation disks; of these, one died of peritonitis.

Mr. Victor Horsley and Mr. Jessett performed this operation in three cases, adopting in each case the method by implantation. All three cases made a perfect and speedy recovery; one dog was not killed until twenty weeks after the operation. The dogs always had perfect health, and got very fat.

There only remains, then, one more question to consider, and that is, in operating

on the intestine, how much of the small intestine may be removed without appreciably interfering with the nourishment of the subject operated on. Dr. Senn has operated on seven cases, removing from twelve to ninety-six inches of intestine. Three of these died immediately from the result of the operation; one died twenty-one days after the operation from marasmus (in this case thirty-four inches of bowel were removed); and in the three that were killed, marasmus is reported to have been extreme.

The result being that, in seven cases, two died from the operation, two died from marasmus caused by the operation, and three were killed at different dates, all suffering from extreme marasmus.

To sum up the result of the different operations above described it will be found to be as follows, namely:

Gastro-enterostomy by approximation plates: 6 cases, 1 death, death-rate equals 16.6 per cent.

Jejuno-ileostomy by approximation plates: 13 cases, 1 death, death-rate equals 7.69 per cent.

Jejuno-ileostomy by Czerny-Lembert sutures: 7 cases, 5 deaths, death-rate equals 71.5 per cent.

Enterorrhaphy by invagination without omental flaps: 4 cases, 3 deaths, death-rate equals 75 per cent.; with omental flaps: 12 cases, 3 deaths, death-rate equals 24.99 per cent.

Ileo-colostomy by implantation: 9 cases, 2 deaths, death-rate equals 22.2 per cent.

Lateral apposition by Czerny-Lembert sutures: 7 cases, 2 deaths, death-rate equals 28 per cent.; by apposition with approximation plates: 3 cases, 1 death, death-rate equals 33 per cent.

And again, by omitting the cases in which the Czerny-Lembert suture was adopted, we have forty-seven cases operated on either by approximation disks or invagination, with eleven deaths, or at the rate of 23.4 per cent.

Now, let us for one moment compare these results with those cases which are published, and with statistics collected of similar operations performed on the human being. The largest number of cases have been collected by Reichel, who, in the *Deutsche Zeitschrift für Chirurgie*, 1883, p. 230, furnishes the result of one hundred and twenty-one cases of resection of the bowel in which the ends were united by Czerny-Lembert sutures; of these, fifty-eight recovered, fifty-eight died, and five recovered with fæcal fistulæ, the death-rate being at the rate of forty-eight per cent. Ill has reported forty-seven cases, with twenty-five deaths, being at the rate of 53.1 per cent., while Weir, of New York, has furnished statistics of thirty-three completed cases of resection of cancerous intestine, with a mortality of 51.5 per cent.

Sir W. MacCormac, in his oration delivered at the Medical Society in May, 1887, on "Abdominal Section," gives particulars of thirteen cases of abdominal section performed for supposed traumatic rupture of the intestines and other abdominal viscera; all these cases died, some from injury to other viscera besides the bowel, some from shock.

Dr. B. Farquhar Curtis, of New York, in a paper read to the New York Medical Society at Albany in February of last year, in connection with a discussion on acute intestinal obstruction, has arranged a table of three hundred and eight cases to show the result of the various methods of treatment adopted by the surgeon, or forced upon him by the exigencies of the case with especial reference to this factor. From a study of this table, it will be seen that the obstruction was removed and an artificial anus formed in fifteen cases, with a mortality of ten, or at the rate of 66.6 per cent. In forty-five cases the portion of intestine was resected and the ends sutured; thirty-nine of these cases died, showing a mortality of 86.6 per cent. The obstruction in these sixty cases was caused by either intussusception, volvulus, adhesion, bands, or internal incarceration in forty-two instances. Dr. Curtis, in referring to the forty-five cases in which an attempt was made to suture the wound in the intestines whether it involved the entire circumference of the wound or not, says that the mortality reached the extreme point of 86.6 per cent.; only ten per cent. of the deaths were from sepsis due to the operation, while more than the usual number—fifty per cent.—were due to the condition of the patient, and twenty-three per cent. were due to the duration of the operation and to shock.

This is surely a strong argument for making the operation occupy as short a time as possible, and Mr. Jessett believes that the methods which he has described are those which will in the future, by enabling the surgeon to perform these operations in a quarter or a third of the time occupied by the system at present practised, be the means of saving many valuable lives, and will reduce

the mortality to that which is now obtained in ovariotomy and hysterectomy. In most extreme cases many surgeons are contented to perform enterostomy and creating a fæcal fistula or artificial anus. But by performing one of the several operations described of ileo-colostomy, jejuno-ileostomy, or enterorrhaphy, any one of which can be accomplished in quite as short a time as that required for the formation of an artificial anus, the surgeon performs a radical operation in the place of a palliative one, and the risk to the patient is not so great, for in the cases in which an artificial anus was formed, reported by Dr. Curtis, the mortality amounted to 66.6 per cent., and then the patient was left either with a permanent fæcal fistula, or would have at some future time to submit to a further operation for its closure.

Now, if we compare the mortality as shown by these statistics with that obtained by Senn's operation as performed by him and confirmed by Mr. Jessett, it will be seen that, excepting the seven cases of jejuno-ileostomy performed by Senn by the Lembert suture, forty-eight operations were performed, with twelve deaths, or a mortality of twenty-five per cent.; but, again, if one omits the fourteen cases in which the operation was performed, but afterwards abandoned for a safer one, the mortality is reduced to 17.6 per cent.

If, then, these figures can be accepted as correct, the mortality from these operations should be reduced from 86.6 to twenty per cent., by adopting the method of operating described, and by further experience and practice the death-rate will be reduced very much lower. But it will be argued that these figures are all very well, and we are willing to accept them for what they are worth, but it must not be overlooked that in all the cases recorded, and in which are claimed such brilliant results, the operations were performed on healthy animals, and the analogy between such operations and similar ones performed on a human being exhausted by disease or pain cannot for one moment hold good! True, but Senn has performed the operation of enterorrhaphy by the Czerny-Lembert system on seven healthy animals, five of which died, giving a mortality of 71.5 per cent., or a death-rate within a fraction of what the same operation is credited with on the human subject.

Again, can it for one moment be doubted if two surfaces of peritoneum can be brought into sufficiently close apposition by the operation advocated, it cannot make any difference in this respect whether the patient be in health or wasted by disease, and further if these operations can be done in twenty to thirty minutes instead of an hour and a half to two hours, does it not follow that the chances of success must be enormously increased?

We now, then, arrive at the third point for our consideration,—namely, *in what form of obstruction of the intestinal tract are these operations applicable?* Mr. Jessett holds that there is no form of obstruction which cannot be relieved by ordinary manipulation, in which either one or the other of these operations may not be practised with every hope of success.

Gastro-Enterostomy.—This operation may be practised for an obstruction arising at either the pylorus, the duodenum, or upper part of the jejunum. The principal form of obstruction in which this operation is to be recommended is undoubtedly malignant disease or stricture of the pylorus. In both these forms of disease the patients, as a rule, are much emaciated and exhausted before they apply for relief; it is then of all importance that any operation should be conducted so as to cause as little shock as possible, and in this case such an end can only be attained by shortening the duration of the operation to its minimum; and this can be attained by the operation already described,—namely, by uniting the stomach and jejunum by approximation plates. The same may be also said with regard to the operation when required for obstruction arising in the duodenum.

It is true that in some forms of fibrous stricture of the pylorus Loreta's operation of opening the stomach and forcibly dilating the stricture has been practised apparently with success, but this operation is quite as formidable as that of gastro enterostomy as practised with approximation disks, and the permanent nature of the relief cannot be so reliable by the former operation as by the latter.

Jejuno-Ileostomy and Enterorrhaphy by Invagination.—These are operations both of which are applicable to cases of obstruction which necessitate the excision of a portion of small intestine either for gangrene of the gut, direct strangulation (for example, hernia, volvulus), fæcal fistula, or contraction of some portion of the intestine due either to .simple stricture or an epitheliomatous growth. Until quite lately, in nearly all such cases, the surgeon has been contented to remove the diseased portion of bowel and establish a fæcal fistula, waiting until a future

day for the performance of enterorrhaphy by means of Czerny-Lembert sutures, thus exposing the patient to the risk of two operations; and each operation is attended with an extremely high mortality.

Of late years, however, surgeons have in several cases excised the diseased portion of intestine, and if circumstances allowed, at once sutured the two ends together either by the Lembert method or Jobert's, or some one of the other numerous plans that have been devised for this purpose by different surgeons.

From the success attained by Professor Senn and the author in investigation, Mr. Jessett ventures to think that there is no case, when enterostomy is performed, in which the continuity of the bowel may not be restored at once, with every chance of success, by adopting one of the operations he is now advocating,—namely, either by approximation of the two surfaces of the intestine, after their ends have been invaginated into themselves, by approximation disks, or by enterorrhaphy, —by invagination of the upper into the lower segment of bowel, after the plan already laid down. Further, in very few cases is the surgeon justified in forming a fæcal fistula.

With respect to the choice of these two operations in special cases, that of re-establishing the continuity of the bowel by means of lateral apposition and approximation disks commends itself mostly, for in all cases of obstruction of the intestine which has lasted for any time the upper portion will be always found to be much dilated, and that portion below the stricture contracted so that it would be most difficult, and, in many cases, impossible, to invaginate the upper into the lower, whereas the approximation of the convex surfaces of the two ends would be comparatively easy to accomplish.

Again, in cases in which the obstruction is the result of adhesion or matting together of the intestine, which adhesion cannot be broken down without injury to the coats of the bowel, there would usually be no difficulty in adjusting the portion of the intestine above the seat of obstruction in apposition with that below, and securing by means of approximation plates, without the necessity of excising the portion of intestine so bound down or matted together, thus materially diminishing the risk to the patient.

Again, it has been shown that the mortality after this operation is very much less,—namely, only at the rate of 7.69 per cent., as against 24.99 per cent. after invagination. This surely, then, must be a convincing proof of the superiority of the one over the other operation.

And, lastly, from the rapidity with which this operation can be performed, occupying, as it does, considerably less time than would be taken in stitching the open ends of the divided intestine to the abdominal walls to establish a fæcal fistula, it must in the future occupy the most prominent position in all operations for the relief of intestinal obstruction of the small intestine.

Ileo-Colostomy.—This is, perhaps, the most interesting of all the operations described, and it is likely to play a very important part in future surgery for the relief of irreducible intussusception of the ileum into the cæcum and malignant disease of the colon.

Hitherto the only operative means for relief in such cases, if resection be not performed, supposing the abdomen to be opened and, in the one case, the invagination found to be irreducible, or, in the other, the growth such as cannot be removed, has been enterostomy, and the establishing of an artificial anus; but this operation, performed under these circumstances, has been found to offer less chance of recovery than enterostomy for simple stricture of the smaller intestine. As Treves has pointed out (referring to this operation for relief of intussusception), "not only is the obstruction relieved, but a portion of gut is left in the abdominal cavity that may cause fatal mischief. The unreduced intussusception may, in spite of the artificial anus above it, become gangrenous, or its walls may ulcerate, or the inflammation existing in its tissues may lead to fatal peritonitis. It is only by an excision of the involved segment that these evils can be obviated." In thirteen cases of enterostomy, or enterectomy, for intussusception, collected by Mr. McArdle, Dublin, ten died, four from gangrene, three from septic peritonitis, and two from exhaustion.

Now, by performing ileo-colostomy by implantation, these difficulties may be overcome, the continuity of the bowel be re-established, and a fæcal fistula avoided. Moreover, in many cases it would not be difficult to remove, through the opening in the colon, the invaginated portion of small intestine.

As we have seen, the mortality of this operation is exceedingly small. Ileo-colostomy might be had recourse to also in all cases where colectomy has to be performed, as it is equally easy to implant a portion of small intestine into the sigmoid flexure, or, indeed,

into the rectum, as it is to implant it into the ascending colon.

Finally, the conclusions to be drawn from what has been said are obvious, namely:

1. Gastro-enterostomy, jejuno-ileostomy, and ileo-colostomy should always be performed by lateral apposition, by approximation decalcified bone plates.

2. But when enterorrhaphy is performed, it should always be by invagination of the upper into the lower portion of the gut, and that continuity of the peritoneal surfaces of the ends of the bowel to be united should be procured, where the mesentery is detached by stitching the peritoneum together over the denuded surface of intestine with fine catgut sutures before the bowel is invaginated.

3. In cases of complete division of the bowel, circular enterorrhaphy is not to be recommended, but the ends of the divided bowel should be closed by invagination, and the continuity of the canal established by means of lateral apposition and approximation disks.

4. That a fistulous opening should be established between the bowel above and below the seat of obstruction by lateral apposition and approximation disks in all cases where it is deemed inadvisable to remove the obstructed portion of the intestine.

5. That an artificial anus should never be formed unless it is found to be absolutely impracticable to re-establish the continuity of the intestinal canal by one of the operations named.

6. That ileo-colostomy, or ileo-rectostomy, either by means of approximation disks or implantation, should always be performed in cases of ileo-cæcal invagination, which cannot be reduced by gentle traction, or malignant diseases of the colon.

7. That omental grafts some two inches wide, or omental flaps, should be adopted in all cases of circular enterorrhaphy, as experience shows these grafts retain their vitality, and become adherent in a few hours.

THE THERAPEUTIC ACTION OF SENNA-PODS.

In the *Lancet* for July 27, 1889, DR. A. W. MACFARLANE said that although he had for several years discarded the use of senna in most of its forms, at the suggestion of Dr. Thomas Keith he tested the utility of the senna pods as a laxative in various cases of obstinate constipation. As it was early apparent that their properties differed vastly from those of senna-leaves, he made a number of investigations to ascertain wherein the disparity of their action lay.

In the first place, it is well known that an infusion of senna-leaves has a characteristic and nauseous taste and odor; that it acts as a mild acrid or drastic purgative, exciting increased peristaltic movements in the small intestines, which, hurrying the contents quickly through the colon and rectum, cause the evacuation of watery stools in four or five hours; inducing concurrently, in many instances, hyperæmia of the pelvic blood-vessels, which excites or aggravates hemorrhoidal and menstrual losses. Its administration is so commonly attended by griping, tenesmus, and flatulence, that it is seldom prescribed except in conjunction with a carminative, these disagreeable symptoms being more marked if the leaves are long infused, to obviate which the time fixed for the preparation of the infusion in the British Pharmacopœia is half an hour. In nursing women the active principles of senna-leaves are partially excreted through the milk, giving rise to griping and purging in the infant. On account of the irritating effects, the infusion of senna has long been discarded in cases in which there is any tendency to congestion of the gastro-intestinal canal, to miscarriage, and to hemorrhoids, etc.; and, in consequence of its drastic and depressing properties, it has been deemed an unsuitable remedy in neurasthenic conditions.

The products of the senna plant, as imported into this country, consist of leaves, stalks, pods, and flowers, with certain other extraneous materials; these are sent to the great prisons to be picked, and the leaves are carefully selected and returned to the druggists, while the other parts are rejected. Senna-pods have been so little used in Great Britain that no reference is made to their medicinal properties in any of the text-books on materia medica or therapeutics. They are thus described by the late Dr. Scoresby-Jackson in his "Note-Book on Materia Medica:" "Legumes, pendulous, flat, slightly enlarged over the seeds, upper margins a little curved, brown, containing from five to eight seeds." The only references to their therapeutical employment are as follows: 1. By Dr. James, in the "New Universal English Dispensatory," second edition, 1752, page 252: "The follicules or fruit of the sena (*sic*) tree purge in a less degree than the leaves." 2. By Dr. Pereira, in

his work on the "Elements of Materia Medica and Therapeutics," third edition, 1853, vol. ii., part 2, page 1870: "The legumes are much milder in their operation than the leaflets." 3. By F. A. Flückiger and D. Hanbury, in the "Pharmacographia," 1874, page 191: "The Arabian and the mediæval physicians of Europe used both the pods and the leaves, preferring, however, the former. . . . The pods (folliculi sennæ) are still employed in some countries." It is thus apparent that the dissimilarity of action which exists in the leaves and pods was long ago appreciated.

An infusion of senna-pods is almost free from taste and smell; certainly it is devoid of the characteristic odor and flavor of "senna." It appears to increase activity in the muscular movements of the whole gastro-intestinal canal, acting quite as much on the colon and rectum as upon the small intestine. It is slower in its action than an infusion of the leaves, but equally certain; an ordinary dose produces without fail one motion, seldom more, of soft consistence, in from eight to ten hours, and without exciting any congestion of the pelvic vessels, or increasing or aggravating hemorrhoidal or menstrual discharges. It is, in short, a reliable evacuant, free from irritating properties such as cause griping and flatulence; and, if the experience of one case is worthy of mention, it does not appear to be excreted through the milk in the nursing mother, for in one such patient the child was unaffected by its use. Administered regularly for several nights in cases of intestinal torpor, it cleans the tongue, increases the appetite and digestion, and promotes natural evacuation of the bowels, so that the quantity taken requires to be decreased, and eventually it can be dispensed with. The cases in which Dr. Macfarlane has found it most serviceable are those depending upon impaired muscular movements, from defective innervation, usually associated with flatulence and intestinal discomfort. It has also proved useful in cases of hemorrhoids, and in constipation in children, as well as in the aged. Like all purgative medicines, the infusion acts better in some persons than in others, and also in the same person at different times; but, after a fairly extended experience of its use, the author says that in no case has he ever been disappointed in its utility, nor has he been annoyed by any untoward effects. Naturally it cannot be expected that it will meet the exigencies of every case of constipation, but it certainly seems a real addition to our remedies, even, according to the statement of Dr. Macfarlane, exceeding cascara sagrada in efficiency, while its freedom from disagreeable taste is a strong point in its favor.

The author claims that the pods are quite as harmless as castor oil, and that he knows of no condition which contraindicates their use. The dose for an adult is from 6 to 12 pods; for the young and very aged, from 3 to 6. They are best infused in a claret-glassful of cold water. Dr. Macfarlane has also prepared a plain and simple fluid extract of the pods, a dose being from ½ a drachm to a drachm in a wineglassful of cold water at bedtime. It has little taste and is certain in its action, while the preparation possesses the advantage of always being ready for use.

SPONDYLALGIA.

Dr. Max Buch describes in a preliminary communication to the *St. Petersburger Medicinische Wochenschrift* a nervous cardialgia, the pain in which he discovered to be strictly confined to the anterior surface of the vertebral column, and to be caused by pressure. The pain is so exclusively due to pressure upon the bone that in those of his forty cases in which it was referred to the epigastrium the result of pressure over this region was not merely absence of pain, but rather a feeling of comfort, while pressure on the vertebral column in the umbilical region caused not only local pain, but a neuralgia also, radiating into the epigastrium, and exactly corresponding with the spontaneous pain. Spondylalgia may, according to Dr. Buch, reach as far down as the sacral promontory; in which case, however, some parts of the vertebral column are usually more sensitive to pain than others, or special localities alone are sensitive to pressure. Spontaneous pain also may affect the whole column, and patients often complain during attacks of gastralgia of a pain affecting both sides of the sternum, extending to the clavicle, or over the middle of the chest and the lower half of the sternum. In most of these cases Dr. Buch succeeded in producing the same pain by exerting pressure on certain points of the abdominal part of the vertebral column. Spondylalgia is, indeed, like true neuralgia, apt to radiate from any point over which pressure is made towards some distant points,

the pain being not only local but also remote. Dr. Buch believes that he has made out a correspondence between certain points: pressure, for instance, about an inch above the umbilicus generally causes pain in the region of the sacro-iliac synchondrosis, or a little above the sacrum; pressure about an inch below the umbilicus causes pain, radiating into the epigastrium, and especially into the pit of the stomach. In one patient, a woman of 40, pressure in the umbilical region caused a pain like compression in the middle of the vertex, exactly similar to clavus hystericus. Pressure on the spinous process was rarely painful. Other symptoms of spondylalgia are malaise, eructations (often sour), ravenous appetite, or a feeling like that of hunger. The bowels are normal or a little constipated; diarrhœa is rare. In some cases painful pulsation of the abdominal aorta was observed. All the symptoms of spondylalgia most frequently denote general neurasthenia. They also occur in chlorosis and diseases of the uterus. The affection is, pathologically, a neuralgia of the vertebral plexus of the abdominal sympathetic, to which the name "spondylalgia" has been given by Dr. Buch as being short and graphic. His treatment consists in a subcutaneous injection of a fifty per cent. solution of antipyrin into the abdominal region, or, in cases of neuralgia, at the seat of pain. The injection is rather painful, and the puncture if left to itself remains so for many days. If, however, massage is practised immediately after the injection, first lightly and then with some amount of energy, to disperse the liquid, the sensitiveness disappears in about ten minutes. Dr. Buch used the antipyrin injection, according to circumstances, daily or every two or three days. A complete cure occasionally took place after one or two injections, but sometimes only after ten or more. Improvement was generally observed after the first injection. The original affection must, of course, never be neglected, and in chlorosis the spondylalgia has been known to disappear under the administration of iron. He mentions, as particularly interesting from the therapeutic point of view, cases in which the spondylalgia disappeared under long-continued palpation, so that massage of the abdomen may in some cases be an excellent method of treatment. In conclusion, the author states it as his opinion that the affection is very common, and that every case of cardialgia and dyspepsia ought to be examined for traces of it.—*Lancet*, August 10, 1889.

LOCAL TREATMENT OF CHRONIC ENDOMETRITIS.

According to the Paris correspondent of the *Medical Press* (July 31, 1889) M. POLLAILON has just laid before the Académie de Médecine a suggestion as to the treatment of chronic endometritis by chloride of zinc pencils. A cardinal point, the learned member contends, is the finding the proper dimensions to give to the substance, not so much as regards its length as its thickness, which should not exceed a quarter of an inch in any case. The action of the chloride of zinc is rapid, and from the fourth to the twelfth day the eschar comes away, and the *suites* of the operation are always very favorable. The pain is slight, and no febrile reaction is observed. To avoid any complication, the patients are ordered to keep to their bed three days, and lie on the sofa five or six days, or until the slough becomes detached. At the end of three weeks, a complete cure is generally obtained. Out of forty cases, those treated by M. Pollailon, thirty-eight were cured. The menses are not interfered with by the caustic. As to the indications and counterindications, all chronic endometritis with purulent secretions, all infectious or hemorrhagic endometritis, and even all uterine hemorrhages, except those provoked by confinements or large tumors, are benefited by this treatment. However, in the case of young women, this cauterization should be used with care. It was said that it caused sterility, but every young woman affected with chronic endometritis is sterile, and remains so unless treated. Acute metritis and ovaritis would be counterindications to the employment of chloride of zinc.

A NEW TREATMENT FOR TINEA TONSURANS.

A new mode of treatment proposed by M. VIDAL has for its object the destruction of the trichophite by microbicides, and the prevention of its reproduction by depriving it of oxygen, for, as is well known, this is an aërobic organism.

M. Vidal fulfils these two indications, *first*, by the employment of spirit of turpentine as a parasiticide; and, *second*, the covering of the affected part with caoutchouc. The following is the technique of his method of treatment (*Gazette Hebdomadaire de Médecine et de Chirurgie*, July 26, 1889):

First.—The application of lotions of spirit

of turpentine to the scalp without previous epilation.

Second.—Friction with tincture of iodine, which should at each sitting only be applied to a limited surface of the head. This should be repeated two or three times for each spot, until it has been applied to the whole scalp.

Third.—Daily inunction of the scalp at intervals with vaseline.

Fourth.—Covering the head with a rubber cap, which should fit as closely as possible to the surface of the head.

It is claimed that by this method epilation is avoided and the duration of the treatment is greatly shortened.

THE TREATMENT OF PULMONARY TUBERCULOSIS BY HOT AIR.

Among recent methods of treatment is that of Worms and Krull, of inhalations of hot or cold air. The tubercle-bacillus being able to flourish only between restricted limits of temperature, the idea naturally occurs that its development may be prevented by raising or lowering the temperature of the inspired air above or below those limits. Worms recommends cold air; Krull has tried inhalations of hot air. PROFESSOR DE RENZI also prefers the second, chiefly because the required temperature is more easily obtained with inhalations of hot air. The hot air is obtained from a strongly-heated spiral tube; before reaching the mouth of the patient it passes through a tube in which is placed a thermometer indicating exactly the temperature of the air inhaled. A special metallic mask is used for the face, and a layer of cotton is placed between the mask and the skin. He has treated eight patients in advanced phthisis in this manner; three were distinctly benefited. The inspired air, to exert a marked effect, must be very hot; no effect is obtained with inhalations of air at the temperature of 43° or 46° C., such as Krull uses. This is not sufficient to modify sensibly the state of the tissues infected by the tubercle-bacillus. Air heated to between 80° and 160° C. is very well borne by the patients. The mask becomes hot and burns the skin, but if this is avoided by carefully padding, air at the temperature indicated is tolerated without difficulty. In one patient inhalations at 180° C. caused no discomfort. The temperature he recommends as most convenient and best borne is from 140° to 160° C. The duration of each inhalation is from fifteen minutes to one hour. One patient had hæmoptysis during treatment, but he had often had it before. All the patients so treated felt better and stronger, and wished to continue the treatment. In some the weight of the body increased, and the quantity of the bacilli in the sputa sensibly diminished. The pace of the heart and respiration is quickened by the inspiration of the hot air, and the general temperature of the body is raised, but all subside as soon as the inhalation is over.—*London Medical Recorder*, July 20, 1889.

SOME NEW DRUGS.

The following statements as to a number of new drugs are published in *Les Nouveaux Remèdes* for July 8, 1889:

Mutisia viciæfolia Cav.—This plant is a native of the Andes, and, according to DR. SAAC, its active principle is attributable to a bitter substance contained in the seeds. The Indians employ it in cardiac affections, epilepsy, and many other diseases, while Perreira is said to have obtained good results from it in hysteria. From the investigations of Dr. H. Rusby, it appears that this drug acts favorably in affection of the respiratory passages, but especially in the disturbance of cardiac action, which is so often consequent upon ascent of high altitudes. In these localities coca is employed as a prophylactic and stimulant, while mutisia is used whenever there is any feebleness of the heart. Thirty-six different species of mutisia have been discovered.

Geronia speciosa, one of the Bigoniaceæ, is indigenous to South America, where the natives call it *ipeuva* or *cinco*. According to J. ZEHNDER this drug is employed as a diuretic, and as a local application in syphilis and rheumatism. It is probable that the drug contains alkaloids, but they have not yet been isolated.

Aerocomia sclerocarpa Mart. is likewise found in South America. Its flowers have an odor which resembles that of oil of turpentine, and contain, besides traces of volatile oil, two per cent. of a brownish, yellowish resin which is soft, is soluble in ether and alcohol, has an odor resembling that of incense, and one per cent. of resinous acid, two per cent. of tannin and gallic acid. According to PECKOLT, these flowers possess great popular favor as a remedy in leucorrhœa, and as a gentle astringent in diarrhœa, hemorrhages, and albuminuria.

METHACETIN.

A few months since reference was made in these columns to a compound that had been reported upon favorably as an antipyretic and antineuralgic, and which from its analogy to phenacetin had been named "methacetin." The relation of these compounds to each other is easily apparent on comparison of the formula by which they are represented, from which it appears that methacetin differs from phenacetin in containing a methyl group in the place of an ethyl group:

$$C_6H_4\begin{cases}O.C_2H_5(1)\\NH.C_2H_3O(4)\end{cases}\qquad C_6H_4\begin{cases}O.CH_3(1)\\NH.C_2H_3O(4)\end{cases}$$

Phenacetin. Methacetin.

If the comparison be extended to antifebrin, it may be stated that antifebrin is acetanilide, phenacetin is oxyethylacetanilide, and methacetin is oxymethylacetanilide. Methacetin is now stated (*Pharm. Zeit.*, July 10, p. 419) to crystallize in shining white, odorless, and almost tasteless scales, melting at 127° C., and boiling undecomposed above that temperature. It is soluble in 526 parts of water at 15° and 12 parts at 100°, while phenacetin requires 2500 parts of water at 15° and 86 parts of water at 100°; it follows, therefore, that the solubility of methacetin in water is five times as great as that of phenacetin. In alcohol and acetone methacetin dissolves very freely, and also in chloroform, especially when warmed. It is less soluble in benzol, and only difficultly soluble in carbon bisulphide, petroleum, benzine, and ether. Upon cooling or evaporation of a solution, the methacetin separates unaltered in handsome crystals. It is also freely soluble in glycerin and fixed oils, especially when heated, and with more difficulty in turpentine and other essential oils. An aqueous solution is neutral in reaction, and should not be affected by barium chloride, silver solution, or ammonium sulphide. Heated on platinum foil, it should burn without leaving any residue. In most of its known chemical reactions it resembles phenacetin, from which it is best distinguished by its physical properties. For instance, if methacetin be heated with insufficient water for its solution, it melts and solidifies again upon cooling, but phenacetin heated with the same quantity of water does not melt. In respect of the therapeutic value of methacetin, Dr. Weller corroborates what has been previously stated, and says that in its action it corresponds in every respect with phenacetin.—*Pharmaceutical Journal and Transactions*, July 27, 1889.

FAVORABLE ACTION OF PILOCARPINE IN DYSTOCIA ON ACCOUNT OF ANASARCA.

Dr. Cirera reports in a recent number of the *Gaceta Med. Catalana* (*Deutsche Med. Zeitung*, July 25, 1889), the case of a primipara, 18 years of age, who in the fifth month of pregnancy commenced to suffer from œdema of the feet, which gradually extended until finally there was complete anasarca with scanty urination. According to the report labor had apparently lasted for three days before the writer was called, when he found that the uterine contractions had entirely ceased, though the child was still living.

The presentation was of the vertex, while the os was dilated to about the size of a silver dollar. Dr. Cirera made a subcutaneous injection of ⅓ grain of muriate of pilocarpine, which was shortly followed by the return of the uterine contraction, accompanied by the physiological action of the drug, and terminated in a few hours in the natural birth of the child. The subsequent progress of the case was entirely normal.

From this observation the author concludes that, in addition to its power of producing secretion of sweat, pilocarpine also is a stimulant of the uterine muscular tissue; even although it possesses in pregnant animals no stimulating power in the uterus, he claims that when the labor pains are present the use of pilocarpine will intensify them if feeble, or if they have disappeared will cause their reappearance.

THE TREATMENT OF CONSTIPATION IN CHILDREN.

In the *Lyon Medical* for August 4, 1889, Dr. Eloy publishes the following formulæ for the treatment of constipation in children:

1. *Constipation in the New-Born.*—Monti and Widerhofer prefer mannite to manna in the treatment of constipation in new-born infants. Dissolving 5 to 10 parts of crystallized mannite in 50 to 100 parts of water, 1 teaspoonful of this solution being given every two hours.

Another preparation in great favor in Austria has the following composition: Powdered rhubarb-root, 45 to 75 grains; carbonate of magnesia, 45 to 75 grains; oil of fennel or anise, 80 drops. A pinch of this powder may be given three times daily.

2. *Constipation in Children from 2 to 4 Years of Age.*—For children of this age, either the purgative mineral waters may be prescribed,

or the following purgative syrup may be administered in Seltzer water: Citrate of magnesium, 1 ounce; lemon or other fruit syrup, 10 drachms; distilled water, 2 ounces.

Children will also readily take castor oil when mixed with equal parts of syrup of orgeat; one or two teaspoonfuls will suffice.

TYPHOID FEVER IN DOGS.

The greater part of the difficulty which has attended all attempts to determine the microbic nature of typhoid fever has been explained as attributable to the fact that the disease is not communicable to dogs. We have recently published an account of the researches of Dr. Vaughan in this connection, but it would appear from the paper published by DR. J. B. ROBERTS, in the *Indian Medical Gazette* for June, 1889, that dogs do not enjoy the immunity from typhoid fever which is generally admitted. While stationed at Sialkot during the last cold weather, Dr. Roberts was led, by the occurrence of a heavy mortality among dogs of European breeds, to make a series of post-mortem examinations. In a certain proportion of cases he found the following coincident lesions: 1, an enlarged, dark-colored, friable spleen; 2, swollen, inflamed mesenteric glands; 3, large oval ulcers in the ileum; 4, swollen oval patches; 5, points of submucous hemorrhages; 6, large intestine with submucous hemorrhages along the crests of the longitudinal rugæ seen in the dog; 7, inflamed vermiform appendix. The animals presenting these lesions had suffered during their illness from continued indisposition, increasing debility, distaste for food, vomiting, and stools, which, if passed by a human patient, would be at once pronounced typhoid, though this was by no means invariable, as constipation might be present. The temperature might be high (in one case it was 104.5°), but temperature in dogs, though normally about 100°, can easily be raised to 103° or higher by exercise.

In commenting on this observation of Dr. Roberts, the *British Medical Journal* for August 3, 1889, calls attention to the fact, that about four years ago Mr. Bland Sutton communicated to the Pathological Society of London a paper on the occurrence of a disease in monkeys and in beavers, which he identified with the typhoid fever of man; he also observed the lesions in a tiger in a solitary case. The only symptoms observed during life were diarrhœa and hemorrhage, but it was not possible to make careful clinical observations. He pointed out that M. Serres had recorded the occurrence of typhoid fever in monkeys, dogs, and cats, and had made some extended observations during an epidemic which occurred among the monkeys in the Musée d'Histoire Naturelle, in Paris; the symptoms observed were diarrhœa, increased frequency of pulse, and fever, ending almost always in death. Dr. Roberts suggests that if further examination should prove that dogs, as he suspects, are liable to typhoid fever, that fact would help to explain the continued prevalence of the disease in Indian cantonments, in spite of the sanitary precautions taken.

THE LOCAL TREATMENT OF ERYSIPELAS.

It is now tolerably well recognized that the destructive fever in erysipelas can only be arrested through the prevention of the spread of the local process, and unless this be accomplished all antipyretics will fail in arresting the fever. For more than a decade numerous remedies have been employed with more or less success in the local treatment of erysipelas. In many cases marked success will be attained through the use of Professor Wölfer's so-called mechanical treatment of erysipelas.

In the *Wiener Medizinische Wochenschrift* for July 6, 1889, DR. BERTHOLD HAMBURGER writes that he has obtained most satisfactory results by a much simpler and more practical method, which he has employed for more than ten years. His plan consisted in painting with tincture of iodine around the margin of the erysipelatus spots a border about one or two inches broad, the application to be repeated at least twice daily as long as there is any tendency of the disease to spread. Dr. Hamburger claims that in this way the extension of the disease may be readily prevented, even when it occurs on the head. No complaint is made as to any irritation being produced by the constant use of the iodine tincture, a fact which is, however, explicable on the ground that not more than a few days at the most are required to arrest the spread of the affection. In a few cases the author states that in twenty-four hours the local process will be ameliorated, and will be accompanied by a corresponding falling of temperature. The author states that the skin must be tested by the touch in order to accurately determine

the limit of the disease. For extreme sensibility may be present considerably beyond the visible limits of the disease, and the iodine should be applied on the healthy skin beyond the limits of increased sensibility. Local application of oils and cold on the erysipelatous localities will prove most agreeable to the patient.

RENAL COMPLICATIONS IN WHOOPING-COUGH.

Some time ago Dr. Stefano Mircoli pointed out that he had several times observed renal complications in whooping-cough. Thus, on one occasion, among ten children suffering from the disease, nephritis occurred in two cases, one of which died. The necropsy left no doubt as to the existence of the renal affection. During another outbreak, among thirty-five cases, nephritis developed in four. Two of these died, and in one a post-mortem examination was made. The kidneys were examined microscopically, and were seen to be in a condition of severe parenchymatous nephritis. No micro-organisms could be seen. Recently Dr. Mircoli has brought forward additional evidence on the subject. In a recent epidemic at Monterubbiano, of twenty-four patients, three died, one from suppression of urine, another from suffocation in a paroxysm of coughing, and a third from marasmus. In the two latter cases, although during life there were no symptoms of renal affection, on post-mortem examination venous stasis in the kidneys with commencing albuminuria was found. There was also a considerable amount of hemorrhagic infiltration. Cultures of the kidney-tissues gave negative results. Dr. Mircoli believes that the renal affection is due to venous stasis caused by obstruction of the vena cava through the violent paroxysms of coughing. According to him, the kidney is affected, in whooping-cough, in twelve per cent. of cases occurring in children.—*London Medical Recorder*, July 20, 1889.

DIABETES MELLITUS AS A CONSEQUENCE OF EXTIRPATION OF THE PANCREAS.

J. von Mering and O. Minkowski have found that extirpation of the pancreas in dogs is followed by diabetes. (*Medicinisch-Chirurgische Rundschau*, July 15, 1889). The diabetes begins a short time after the operation, and persists without interruption for weeks at a time up to the death of the animal. In addition to the appearance of sugar in the urine, polyuria, great thirst, hunger, and rapid emaciation occur in spite of abundant feeding. In one dog in which the authors removed the pancreas, and which had fasted forty-eight hours, the urine contained from five to six per cent. of sugar, while another dog, weighing sixteen pounds, fed on exclusive meat diet, eliminated daily almost one litre of urine, with six to eight per cent. of sugar. When grape-sugar was added to the diet the percentage of sugar in the urine amounted to thirteen per cent., the greater part of the sugar given being eliminated unchanged.

It is also worthy of mention, that in dogs subjected to this operation, the urine contains a considerable amount of acetone. It was also noticed that the percentage of sugar in the blood was greatly increased; in one case it amounted to .30 per cent., and another .46 per cent. No glycogen was found to be in any of the organs after death, even in animals on full meat diet, which had been diabetic for four weeks or more.

It is stated that there was no injury to the solar plexus in the operation, so the diabetes is to be regarded as a direct consequence of the extirpation of the pancreas.

Transfusion of blood from a diabetic dog into the veins of a healthy animal did not produce excretion of sugar in the latter. The authors' experiment also showed that in animals in whom the pancreas had been extirpated absorption of fat and assimilation of proteids was seriously interfered with.

PULSATILLA IN THE TREATMENT OF EPIDIDYMITIS.

Dr. Robert J. Carter states in the *Lancet* for August 3, 1889, that for some time past patients at the Male Lock Hospital with gonorrhœal epididymitis have been treated by the internal administration of pulsatilla. The drug was exhibited in the form of the tincture, the doses given varying from 5 to 30 minims every four hours. One patient only complained of nausea after taking the drug. In the case of patients taking the larger dose the pulse-rate was perceptibly lowered, although in one case in which observations were made no diminution of temperature took place. Without going into the details of the cases, a comparison with others treated by the usual methods shows that in no in-

stance was the duration of the pain and tenderness less than the average; and, in fact, in several cases treated by pulsatilla alone, without local applications, the pain lasted rather longer than usual. The severity of the inflammatory process, as evidenced by the amount of plastic exudation thrown out, does not appear to be influenced at all by this drug. In fact, cases treated by it pursued the same course as when treated by simple rest in bed, attention to the emunctories, etc.; and, according to the writer's experience of the drug, it is not even a useful adjunct to the treatment of epididymitis.

TREATMENT OF PSORIASIS WITH HYDROXYLAMINUM.

In an article upon the value of this new remedy in the treatment of psoriasis, DR. FABRY gives his experience after observing twenty-four cases thus treated in the service of Dr. Doutrelepont, of Bonn (*Archiv für Dermatologie und Syphilis*, Heft 2, 1889).

Hydroxylamin was first obtained by Lossen, in 1865, from the reduction of nitrous acid; it is one of the bodies allied to ammonia, NH_3 being ammonia and NH_2OH hydroxylamin, and, like ammonia, has the peculiarity of readily entering into combination with hydrochloric acid.

NH_3HCl = sal ammoniac.
$NH_2OH.HCl$ = hydroxylamin muriaticum.

The hydrochloric combination of hydroxylamin is characterized by its ready solubility in water, alcohol, and glycerin, and these combinations turn blue litmus-paper an intense red.

It is a narcotic, and produces paralysis of the nerve-centres, and in large doses produces convulsions and death. Experiments upon animals and upon blood outside of the body have shown that oxyhæmoglobin of the blood is transformed by hydroxylamin into methæmoglobin by abstraction of oxygen. This reduction property which it possesses is very energetic and rapid.

In treating psoriasis, the author employs either an alcoholic solution, such as:

℞ Hydroxylamin muriat., .2 to .5;
Spirit. vini, 100;
Calcar. carbon., q. s. ad neutr.
D.S.—Apply with brush.

Or a watery solution, applied as in a hydropathic band:

℞ Hydroxylamin muriat., 1;
Aquæ font., 1000;
Calcar. carbon., q. s. ad neutr.
D.S.—Apply as wet cloth.

As in other applications, the scales are to be first removed by bathing, rubbing with green soap, and applications of ten per cent. zinc salve. As this new substance has decided toxic properties, the 1 to 1000 or 1 to 500 neutralized solution is used in the beginning, and the stronger applications, up to one-half per cent., are gradually employed, being painted on the diseased areas twice daily. A cloth wet in the solution, or a Priessnitz band, can be applied every two hours to suitable parts. As is the case with pyrogallol, chrysarobin, and some other substances, albumen may appear in the urine as a consequence of absorption of the drug. So far as a radical cure of psoriasis is concerned, hydroxylamin promises no more than the substances now used as external applications, recurrences appearing to be quite as frequent as after older methods. The features of this new remedy which recommend it are its cheapness, the fact that it does not stain the clothing, and does not produce dermatitis of the healthy skin in the way chrysarobin and pyrogallol do, while being quite as active an agent in removing the lesions of psoriasis. So that the author does not hesitate to advise its use in this disease.

So far as the length of treatment required to remove the lesions is concerned, it appears that the action is not more rapid than that of chrysarobin, a four to six weeks' course being necessary. In the degree of effect produced, it does not fall behind that of other reduction agents now in use, but its effects upon the system must be watched. In some patients, so much pain from the stronger applications is complained of, that other means have to be substituted or the treatment intermitted.

Eichoff is reported to have had some good results with the remedy in lupus, herpes tonsurans, and parasitic sycosis.—*Journal of Cutaneous and Genito-Urinary Diseases*, August, 1889.

COPAIBA AS A SURGICAL DRESSING.

In the *Boston Medical and Surgical Journal* for August 8, 1889, DR. H. H. A. BEACH writes that he has for some time been applying the balsam of copaiba to indolent granulated surfaces, by first saturating charpie with the balsam, and, after squeezing out the superfluous balsam, bandaging the charpie upon

the ulcer. The results were highly satisfactory. It is simple, cheap, and quickly prepared, and is now becoming the accepted dressing in the Massachusetts General Hospital, being especially adapted to the flat, pale, granulating surfaces that commonly result from avulsions of the scalp, extensive burns and scalds, also for the cavities after operation for removal of necrosed and carious bone. It has succeeded in raising healthy granulating surfaces for grafting after other stimulating applications had failed. At the hospital it is applied with cotton-waste instead of charpie. The waste can be easily picked apart and cut into short bits by convalescents. The porous nature of the dressing permits a ready absorption of pus and of its partial disinfection by the copaiba, which imparts a fragrant balsamic substitute for the sourish odor of pus partly decomposed.

THE TREATMENT OF SEVERE CHOREA BY PROLONGED SLEEP.

We have already published the experience of Dr. Bastian as to the treatment of severe chorea by prolonged sleep induced by large doses of chloral, and his observations have elicited a paper from DR. GAIRDNER, which is published in the *Lancet* for August 3, 1889.

Dr. Gairdner writes that his experiments enable him to formulate the following conclusions as to the use of chloral in chorea: 1. That it sometimes succeeds in chorea absolutely, where other remedies fail. 2. That it can be depended on, as a rule, in very severe cases, to initiate a treatment which may be afterwards successfully carried out otherwise. 3. That in such cases it has an almost absolute power of suspending or controlling spasm during the persistence of its deep hypnotic action, and is therefore invaluable as a palliative (care being taken, of course, to avoid poisoning, either acute or chronic). 4. That this or other limitations will interfere with the curative action of the remedy in some very inveterate cases; the failure of chloral hydrate in these cases, however, being common to it, with all other remedies.

THE USE OF PHOSPHORUS IN SMALL DOSES IN THE TREATMENT OF RICKETS.

For the past two years DR. MANDELSTAMU, of Kazan, in Russia, has been using phosphorus in small doses in the treatment of rickets, and during that time he has administered the drug to two hundred and fourteen patients of different ages suffering from the various forms of the disease. Of these patients, one hundred and twenty were cured, forty-three showed much improvement, and for the rest the medicine had to be withheld owing to the development of intercurrent disorders. The children were given the phosphorus for several months and even for a year. The dose was 1 centigramme ($\frac{3}{20}$ gr.) to 1000 grammes (1 qt.) of cod-liver oil, 1 dessertspoonful once or twice a day. After two months of this treatment the bones of the skull became more compact, and the fontanelles and sutures less prominent, the nervous crisis and the paroxysms of laryngeal stridor less frequent and pronounced. The patients increased in weight, and the general health manifestly improved. The author did not observe any inconvenience arising from the use of the drug. The phosphorus seems to act beneficially upon the dyspeptic signs which accompany rickets. But he remarks that it is best to choose cases in which catarrh of the stomach and intestines exists with tenesmus to cure this condition before proceeding to administer the phosphorus. He concludes as follows: Clinical observations perfectly justify the employment of phosphorus in rickets. Phosphorus acts better, more quietly, and more surely than any other drugs. The administration of the drug for a long time in small doses is well borne by children and does not produce any ulterior effects. Phosphorus acts favorably, especially in cases of symptoms depending upon the rickety diathesis. Under the influence of phosphorus, in the great majority of cases, the development of the disease is arrested.—*Medical Press and Circular*, July 17, 1889.

Reviews.

GENERAL ORTHOPÆDICS, INCLUDING SURGICAL OPERATIONS. By Dr. August Schreiber. Wood's Medical and Surgical Monographs.
New York: William Wood & Co. Price, $1.00.

The subject of orthopædics is undoubtedly a very important one, both to the physician and surgeon. The former may in many cases, if he possesses some information in regard to the early symptoms, which precede the more decided changes of these lesions, prevent the progress of the disease, or recommend surgical interferences in time to bene-

fit the patient. On the contrary, if such knowledge is wanting, the lesion remains unnoticed, and improper treatment, or more often no treatment, is advised, until the objective symptoms of the disease have progressed so far that the recognition of the trouble is only too evident to all, and also in many cases the time for surgical interferences is past, or if resorted to may only result in temporary relief, permanent deformity, or a useless limb. The importance to the surgeon of having a most thorough knowledge of everything relating to orthopædics is self-evident, since to him both patient and physician turn for assistance.

The frequency of the occurrence of cases which come under the head of orthopædics is also a very important reason why physicians and surgeons should be well-informed upon all relating to this subject. To quote from our author, in Prussia there are said to be fifty-six thousand cases of scoliosis alone; in England and Wales, no less than four hundred and nine thousand two hundred and seven cases of deformities of various kinds are to be found, of which one-fourth, or ninety thousand two hundred and seventy-seven, are met with in London. While we do not believe that the relative number of such cases is so great in the United States, yet the number of deformed individuals here met with is sufficiently numerous as to call for the special study of this class of lesions and the establishment of special institutions for their treatment.

The importance to every physician that he should have some knowledge of orthopædics being granted, it is also important that such information be given to him in an acceptable form. Now the above work of Dr. Schreiber's is one that, in our opinion, most certainly answers the purpose. It affords the general practitioner a means of acquiring all the necessary information, in order to recognize these frequent lesions, and in many cases to institute proper treatment, or refer the patient to those who have had more experience, and who possess the special appliances for the relief or cure of this class of cases. While the etiology and pathology of the lesions considered by Dr. Schreiber are both given, yet the descriptions are not encumbered by theories and discussions, confusing to the reader and useless in practice.

The treatment advised by the author will be found to be that which experience and investigation has proved to be the most suitable. Where he has adopted measures differing from those most generally accepted, his reasons for so doing are clearly and forcibly given. In concluding our notice of this work, we do so fully convinced of the value of its contents, and unhesitatingly recommend it to all who desire information upon the special subjects of which it treats. We regret, however, to speak unfavorably of any portion of the work, but the illustrations, for the most part, are so very poor, that their omission from the text would have been rather to its advantage than otherwise.

J. H. C. S.

SYNOPSIS OF HUMAN ANATOMY. By James K. Young, M.D.
F. A. Davis, Publisher, 1889.

The questions which naturally arise in one's mind, upon taking up a new book, are, Why was it written? why should we read it? In a word, What object has the author in publishing the book? How to answer these questions, in regard to the above work, we find its author has, in a measure, done so for us. He says, "The object of this little book is, as its title indicates, to furnish a concise though *complete synopsis* of human anatomy." And, again, the reason for such a synopsis, he writes, is "the limited time at their [students] disposal and the unlimited amount of medical material to be digested."

Let us see if we agree with the author in his answers. First, as to the object. Outlines of anatomy are not to be thrown aside as useless; they serve a certain purpose, and in a manner assist the student; but they must not be abused; they should never be the exclusive study and only source of information; they are, as Dr. Young well writes, "to facilitate the acquisition of a subject as difficult as it is essential." Second, while admitting that the student's time is limited, and regretting that the limit is very often too short, it is no excuse for imperfect or superficial knowledge, and, therefore, in all branches of medical education something more than outlines is demanded.

If a synopsis of human anatomy may serve a purpose, and we believe it does, it is very important that the synopsis should be a good one. In this respect the above work may be recommended as a reliable guide. Dr. Young has shown excellent judgment in his selection of illustrations, in the numerous tables, and in the classification of the various subjects, so that, if used as a synopsis only should be, the work has our full endorsement.

J. H. C. S.

Correspondence.

PARIS.

(From our Special Correspondent.)

The International Congress of Therapeutics, Materia Medica, and Pharmacology.

This International Congress has been the important event of the month. Although the sickness of one of its organizers somewhat interfered with the publicity necessary for such gatherings, by dint of hard work and energy Dr. Bardet succeeded in having all the preliminaries and the arrangements ready in time. The meeting was held in the Hôtel des Sociétés Savantes, 28 Rue Serpente, a building which by the way has an interesting history. It was formerly the mansion of a princely family, and a century or so ago passed into the hands of the Pankoucke family, the celebrated publishers, who for several generations used it as a dwelling-place. A few years since it was purchased by a scientific association, which has entirely renovated the structure, and fitted it for the purpose of scientific meetings and societies. It contains, besides a large well-lighted hall with about five hundred seats, several smaller rooms for committee or section meetings, secretary's office, cloak-rooms, closets for books and records, and every convenience in general for sedate, quiet scientists who appreciate comfortable seats and have due regard for other people's furniture. The new entrance is on what will be the Boulevard St. André-des-Arts, running from the Place St. Michel to the Boulevard St. Germain, opposite the new library building of the Faculty of Medicine. One good result of the new boulevard is that it will bring air and light into a labyrinth of old, narrow, and crooked streets, of which the Rue Serpente—a suggestive and merited name—is a good specimen.

The Congress was well attended, and attracted especially a large quota of foreigners from nearly all parts of the world,—except, of course, Germany. Yet she had been invited, and some of her scientists, among them Professor Flückiger, had sent in their adhesion. But at the last moment a request was received to strike the names from the lists. Although no reason was given, it was presumed the step was taken in obedience to some semi-official hint, which it is dangerous not to heed. It is unfortunate, as German delegates would have been received with due courtesy, and their presence would have greatly added to the interest of the gathering.

As it was, between five and six hundred physicians, pharmacists, and veterinarians sent in their adhesion, about two-thirds of whom attended some or all of the sittings, while some one hundred and twenty participated in the closing banquet on the Eiffel tower. There you may be sure foreign members were in full force, some being invited guests. But they made also a good showing on the roll, between 125 and 150 being in attendance. As regards nationality, they were as follows, so far as can be ascertained: Roumania, as usual, led the van with 25. But Great Britain sent in a contingent of 15, and Belgium 13. Italy and Spain had 11 delegates each, South and Central American States 14, Holland 5, Turkey 4, Switzerland 3, the United States 3, and Portugal 2. Besides, Russia, Austria, Mexico, Greece, Tunis, Egypt, Norway, and Bulgaria were also represented. To mention a few names, Professor Williams, of Boston, Dr. Monteressi, of Key West, and your correspondent stood for the United States; Professors Wood and Robt. Bartholow sent in their adhesion, but were not in attendance. Among the British delegation we may mention Drs. Gubb, Howard, and Burden, and Messrs. Burroughs, Christy and sons, Holmes, Martindale, and Wootton, of London. Drs. Van Bastelaer, Van den Corput, Crocq, Jorissen, and Romnelaer, of Belgium, need no introduction here, neither do Professors Semmola, of Naples, Schaer, of Zurich, Stockwiss, of Amsterdam, Muñoz, of Spain, Mahmoud-Pacha, of Cairo, Zambaco-Pacha, of Constantinople; and, among the French, Drs. Bucquoy, Cadet-Gassicourt, Dujardin-Beaumetz, Hallopeau, Huchard, Lépine (of Lyons), Moutard-Martin, and Constantin Paul. Professors Planchon, Wurtz, and Bourgoin, of the College of Pharmacy, Burcker and Marty of the Val-de-Grâce School, with a strong detachment from the Paris Society of Pharmacy, represented French pharmacy.

On Thursday morning, August 1, the Congress was called to order by the provisional president, Dr. Moutard-Martin. The assemblage soon organized by electing the same president; Dr. Dujardin-Beaumetz, vice-president; Dr. Constantin Paul, secretary-general; Dr. Bardet, secretary-adjunct; and recording secretaries, Drs. Blondel and Labbee. Presidents of honor and section officers were also selected, as will appear hereafter. President Moutard-Martin then returned his thanks in a short address, saying that physiology, chem-

istry, and therapeutics should always walk hand-in-hand, as a condition of progress. After which the gathering divided into two sections, therapeutics and materia medica on one side and pharmacology on the other, each to hold separate sittings in the morning, and both to meet in plenary congress every afternoon. About three-fourths of the members attended the first section, and the remainder, chiefly pharmacists, the second, although some physicians followed the pharmacists, and some pharmacists remained with the physicians, according to the questions on the programme.

For the nonce only topics interesting therapeutics will be considered, and to present the subjects in more convenient shape, instead of following the different sittings as they occurred, each question will be disposed of separately as a whole, though sometimes the discussions occupied portions of various sittings.

FIRST QUESTION.—*The Antithermic Analgesics.*

Chemical Composition of these Bodies—Relations between the Chemical and the Physiological Function—General and Special Physiological Actions of these Bodies, their Functional Classification and Clinical Applications.

Such was the wording of the first question on the programme, intrusted to Dr. Dujardin-Beaumetz as *reporter*. Professor Semmola, of Naples, a perfect master of the French language, directed the discussion as president of honor. And, by the way, it may here be remarked that the professor proved one of the most attractive figures of the Congress, and more than once showed that exquisite skill and *finesse* characteristic of his nation. Dr. Dujardin-Beaumetz, in a printed report, explained the state of the question. He said: "Since chemistry has formed by synthesis a whole series of bodies, all taken from the aromatic series, which have proved to be, first, powerful antiseptics; next, potent antithermics; and, lastly, analgesics, their number has increased every day, and one new discovery rapidly follows another. Fault has even been found with such multiplicity, but we never will have too many medicaments for allaying pain. The important point is to know precisely their elective action and therapeutic indications. Pain is so complex a phenomenon that the same substance will not relieve all its manifestations. The physiological problem is no less complicated. Most of these analgesics are antithermic, a fact showing the truth of the doctrine which declared animal heat to be the result of multiple actions. And, indeed, all the antithermics can be divided into three classes. Some act as antiferments, and prevent hyperthermy as they would any fermenting process. Others have a direct action on the blood-globules, and lower the temperature by decreasing the blood's breathing power. The last prevent hypothermy through their action on the cerebro-spinal centres; they almost exclusively also possess analgesic properties. But, on closely studying their physiological effects, we notice their elective action is exceedingly varied. . . . One last point, and perhaps the most delicate and complicated of modern therapeutics, is to ascertain what relation exists between a substance's chemical composition and its therapeutical properties. With a few medicaments the investigations have been successful. For instance, we know that on introducing by substitution (as modern chemists can do) into the caffeine formula a molecule of either the ethoxyl, the methoxyl, or the hydroxyl group, we can so modify its physiological properties as to turn it from a tetanic into a convulsivant, and especially an analgesic, medicine. For the present, and temporarily, from my investigations in connection with Dr. Bardet, I would draw the following conclusions: Antiseptic effects chiefly belong to hydrated derivatives, like phenols, naphthols, etc. Antithermic effects predominate in amidogen derivatives, like acetanilide, kairin, and thallin. Analgesic properties are more usually to be found in the same amidogen derivatives when to an atom of hydrogen a fatty radical, especially methyl, has been substituted, for instance, dimethyloxyquinizine (antipyrin), acetphenetedine, methylacetanilide. . . . Such are the different questions brought before the Congress for discussion." Dr. R. Lépine (Lyons): "Even with the healthy animal the action of the antithermic nervines of the aromatic series is complex. Like quinine, which they resemble, they stop the activity of the protoplasm, and mostly all alter the red globules, either through a transformation of hæmoglobin into meta-hæmoglobin, or a modification of the globule's constitution. But it is chiefly on the nervous system that their influence is noticeable. Hence my opinion that all true antipyretics are nervines. The nervine action, however, of antipyrin and other antithermics is something more than analgesic effect. They decrease the consumption of glucose, at the expense of the glycogen in the liver and the muscles. Their effect on the consump

tion of albuminoids being variable, and such consumption having but little influence on animal heat, it is to the decreased consumption of hydrocarbons that the hypothermy they produce is to be attributed. To sum up, the agents in question are poisons to the protoplasm, though less powerful than quinine. Their action is chiefly on the nervous system, although it is also dynamic, decreasing animal heat by checking the consumption of hydrocarbons. To call them analgesics is to give a wrong impression of their way of acting."

Dr. Masius (Liege) thought antithermics to be indicated in all febrile diseases, the heat due to fever not being a necessary process of natural elimination.

Dr. Williams (Boston), on the contrary, spoke in English against antipyretics. In his opinion they only retard convalescence, and seldom do any good. Then, by request, he repeated his remarks in very fair French, for which effort he was loudly cheered.

The discussion now deviated into one of clinics and medical practice—Dr. Desplats (Lille) greatly praising antipyretics in many affections, and explaining at length his experience with them and his mode of treatment. As may be expected in a question of doctrine, he soon found dissenters, Dr. Stockwiss (Amsterdam) saying he could not accept such a panegyric on antipyretics, which, in his opinion,—quinine being excepted,—are generally useless and but little better than poisons; and Dr. Semmola adding he quite agreed with Dr. Stockwiss. To his mind antithermics act like poisons. They afford a sort of temporary relief, but at the expense of the patient's strength and early recovery.

Firmer ground, however, was reached with Dr. Hénocque (Paris), who insisted upon the importance of spectroscopically examining the blood of patients submitted to a treatment with these nervine antithermics. As most of them decrease the proportion of oxyhæmoglobin and some, even in doses not usually poisonous, acetanilide, for instance, are apt to cause dangerous modifications, such as the formation of meta-hæmoglobin, there is great advantage in following up the state of the blood. He showed for the purpose an instrument named hæmatoscope, which can be used quite conveniently.

Dr. Assaky (Roumania) next read a paper on *di-iodosalicylic acid*, which he greatly recommended as an antiseptic, analgesic, and antithermic. The nature and preparation of the compound were not given very clearly.

A discussion on *exalgine* ended the subjects coming under the general heading of antithermic analgesics. Dr. Bardet (Paris) read statistics from the Cochin Hospital, where exalgine was administered in seventy-five cases. The record showed the chemical to be especially beneficial in dental and congestive neuralgias and congestive hemicrania (migraine). There is, however, an important point,—namely, to be sure to use the true exalgine—that is, methylacetanilide melting at 101° C. (214° F.)—and not some of its isomers which have different properties. For instance, certain chemists have been selling in England, under the name of exalgine, the aceto-ortho-toluid, which is different, therapeutically, and nearly inert.

Dr. Féréol (Paris) said he had not obtained very satisfactory results from exalgine, while Dr. Desnos (Paris) attributed the failure to insufficiency of doses. So far as he was concerned he (Dr. Desnos) preferred it to antipyrin. Yet he admitted exalgine to be apt to cause vertigo, a sort of drunkenness like quinine, an opinion which Dr. Dujardin-Beaumetz confirmed, adding the symptoms have no dangerous sequelæ, as eruptions and cyanosis are not to be feared. He said that although he was the father of exalgine, so to speak, he considered it inferior to antipyrin, chiefly owing to its sparing solubility.

Second Question.—*Antiseptics.*

Biology of Pathogenous Microbes—Action of Antiseptics either on the Micro-organism itself or on its Toxic Secretions—Mode of applying Antiseptics—Modifications of the Ground.

On Friday afternoon, Dr. Williams, of Boston, was requested to take the chair as president of honor. On complying with the invitation he made a few remarks in slow but very correct French, thanking his fellow-members for the distinction conferred, "which he was well aware was not meant for him personally, but as a mark of regard and friendship towards his country, the United States" [loud cheers].

Dr. Constantin Paul, *reporter*, speaking of the question under discussion, said, "Microbiology, by showing many diseases, especially the contagious and infectious, to be owing to micro-organisms, has greatly enlarged parasiticidal medication. Hence an attempt to classify these medicines according to their comparative activity. But it was soon observed that their properties vary with different sorts of microbes, and it was found necessary to establish a separate scale for each

kind of organism. As therapeutics only are to be considered here, none but pathogenous microbes shall be taken into account, and the parasiticidal action shall be reviewed as it occurs in artificial cultures, to the exclusion of the effect on the organism."

Taking up, next, the various sorts of parasiticides, he began with those preventing putrefaction, and divided them into six classes,—namely, 1, the eminently antiseptic, such as oxygenated water, sublimate and silver nitrate, which, in quantities of from 1 grain to 1½ grains will prevent the putrefaction of one litre of neutralized beef broth ; 2, very strongly antiseptic, those having the same effect in quantities varying from 4 grains to 14 grains, of the type iodine, bromine, etc. ; 3, strongly antiseptic, 20 to 72 grains, potassium cyanide, aluminium, zinc and lead salts, carbolic acid, and tannin ; 4, moderately antiseptic, 90 grains to ½ ounce, quinine, boric acid, chloral, copperas, and caustic soda ; 5, antiseptic, 6 to 96 drachms, manganese, calcium and barium salts, and alcohol ; 6, very slightly antiseptic, 4 to 9 ounces, common salt, glycerin, and sodium hyposulphite. The foregoing is only a condensation of the very long lists compiled by Dr. C. Paul, from data already known to therapeutists.

As regards pathogenous microbes, the following information is more interesting. For instance, it has been found that the growth of the *typhoid fever bacillus* will be prevented by 1 part of sublimate in 100,000 parts of culture ; quinine comes next, but far behind, in the proportion of 1 to 800, and carbolic acid in doses of 1 to 200. The *cholera bacillus* will not develop in acid media. Hence the slightest quantity of free muriatic acid in a culture will suffice, as will 1 per 100,000 of sublimate or 1 per 500, of quinine ; of blue vitriol, or carbolic acid, 1 in 500 or 400 is necessary. The *tuberculosis bacillus* in cultures is interfered with by many antiseptic agents, and especially alum, menthol, iodoform, ether, chloroform, boric acid, alcohol, and boric and arsenious acids. But the cultures are completely sterilized by hydrofluosilicic acid, ammonia, iron fluosilicate, potassium fluosilicate and sulphide, and sodium silicate, while salicylic and benzoic acids, borax, chloral, coniferin, and urethan are utterly inert.

The influence of temperature is no less instructive. Tuberculous matter has a persistent vitality. It will not lose its infecting properties on being heated for twenty minutes at 60° C. (140° F.), or for ten minutes at 71° C., or on being thoroughly dried at 30° C. (86° F.). Neither will it be destroyed on being submitted to maceration and putrefaction in water for a fortnight, or to a succession of freezings and thawings. The typhus bacillus, although its culture stops at 46° C., has also strong vitality. After six months it is still alive, and perfectly stands long dessication as well as freezing.

The cholera bacillus has but slight vitality. Its cultures die after half an hour's drying at ordinary temperature. A temperature of between 50° and 55° C. (122° to 131° F.), or a trace of some mineral acid, will suffice to kill all the microbes in a culture. Vegetable acids are less effectual. Freezing to —10° C. (—14° F.) has no effect.

The other microbes are less known. It has only been ascertained that, as a rule, they are not destroyed by congelation, a remark that should not be understood to apply to the yellow-fever germs, as the disease is almost unknown in Europe.

In the discussion which followed Dr. Constantin Paul's statement of the question, Dr. Semmola said he had obtained beneficial results from flowers of sulphur to produce intestinal antisepsy, given in doses of 15 to 30 grains every hour, with copious watery drinks. Gastric fevers especially, but also typhoid fever to a certain extent, are amenable to the treatment. The same medicament externally, dusted, for instance, in the bedclothes or the dressing of wounds and ulcers, was found a good antiseptic.

Dr. Constantin Paul, in reference to sulphur, recalled that it was an Italian physician, Dr. Poli, who was the first to recommend sulphites as antiseptics, and that at a time when ferments were not known to be living organisms. To which Dr. Semmola replied that it was not sulphites but pure sulphur that he was recommending ; and Dr. Alvaro (Brazil) observed he had also employed sulphur with success in similar cases, only he preferred precipitated sulphur to the sublimed.

Antiseptics, Dr. Jorissen (Liege) said, are very beneficial in *erysipelas*, but to secure sufficient adhesion and penetration, it is necessary to combine them with a fatty substance. Lanolin being too sticky, vaseline preventing absorption, and lard increasing the cutaneous irritation, a better vehicle is a mixture of vaseline and cacao butter, which is always well tolerated. The most reliable antiseptic is sublimate, which scarcely ever fails, either with infants, adults, or old men. *Fistulæ in ano*, which are undoubtedly kept up by microbes, are equally benefited by antiseptics.

Corrosive sublimate, though other antiseptics might do as well, affords a rapid cure. But it must be introduced far enough,—at least one inch into the rectum.

Dr. Hallopeau (Paris) thought antiseptics are, together with prophylactics, important in *pelada*. Although the parasite has not been discovered, there is no doubt it exists, and should be fought against. Hence hair-combs and brushes, pillow-cases and head-coverings are to be frequently disinfected, either by means of the oven or solutions of sublimate, carbolic acid, etc. As to local treatment, it will consist in either killing the parasite or rendering the ground unfit for its propagation. A great variety of parasiticides have been employed, but at the St. Louis Hospital an alcoholic solution of turpentine is preferred, with 1 per 1000 of sublimate, for bathing the healthy portions of the scalp. The infested parts are treated with repeated blistering, a rapid process discovered by Dr. Vidal, and easily applied with the vesicating solutions now prepared. When the epidermis has formed again, again a blister is raised, care being taken that only small continuous portions of the scalp be vesicated at the same time. With this combined treatment, pelada, which usually lasts several years, and often a lifetime, can be cured in three or four months.

Dr. Hallopeau equally recommended local antiseptics in the treatment of *syphilis*, and preferably mercurials. In consequence as caustics he prefers either acid nitrate of mercury or powdered sublimate. The first, although by far superior to silver nitrate, is often discarded, owing to its painful application, but now the objection has disappeared since the discovery of cocaine's anæsthetic properties. Corrosive-sublimate powder needs careful watching lest it may cause accidents. But no danger is to be apprehended, and much good will result from lotions and baths with sublimate solutions of 1 in 3000 or 5000 parts. Syphilides of the breathing organs are much benefited by fumigations of cinnabar. But iodine and its preparations, especially iodoform, are equally useful. The last may be exhibited either in powder, in an ointment, or dissolved in ether, or even in the shape of gauze or Unna's plaster.

To conclude the chapter on antiseptics, let it be mentioned that at the Section of Pharmacology, M. Balme, of Grenoble, showed a very convenient *sublimate paper* for antiseptic purposes, and illustrated before the meeting its mode of preparation. The paper—white filtering-paper—is ready perforated, like postage-stamps, into small squares, about one inch wide and two inches long, and spread in sheets on little trays, where it rests on glass rods. It is next brought under a calibrated dropper, containing a solution of mercuric chloride and sodium chloride in distilled water, so titrated as to contain exactly 5 centigrammes of sublimate to each 3 drops. The dropper being adjusted to work slowly, 3 drops of the solution are let fall on the centre of each division of the perforated paper, and any convenient number of trays can thus be charged in a short time, without ever touching the solution or the wet paper with the fingers. The sheets, after drying in open air, are bound into little books or parcels, like court-plaster, convenient to carry in the vest-pocket, and with them the surgeon or physician can at any time readily prepare sublimate solutions of the exact strength desired, by simply soaking one or more squares in a given quantity of water. An advantage, pointed out by M. Vigier, is that while sublimate applied to cotton wadding becomes after a time partly insoluble, the change never occurs with good paper free from earthy impurities.

Third Question.—*On Heart Tonics.*

"Classification of these Tonics—Physiological and Toxic Action—Direct Action on the Cardiac Muscles and Nerves—Comparative Value of the Plants and their Active Principles—Therapeutic Indications." *Reporter*, Dr. Bucquoy.

This most important question was taken up at several sittings, and concluded on Saturday afternoon, at which meeting Mr. Holmes, of the Pharmaceutical Society of Great Britain, was president of honor.

Dr. Bucquoy, on exposing the state of the question, said, "The object of the therapeutist in heart-diseases is less to contend against existing lesions than to stimulate the organ's action when necessary, especially with a weakened or tired heart unable to perform its functions. It is in such conditions that heart tonics are indicated. For a long time *digitalis* has been almost exclusively employed and justly considered as the perfect type of a heart tonic; and we all know what wonderful results often follow medication with digitalis. Within the past ten years the list of cardiac medicaments has much increased, but their value and indications differ, thus imparting much interest to the question on the programme. The following are the new agents, coming after digitalis, which still holds the foremost position: Caffeine, con-

vallaria majalis, adonis vernalis, spartium scoparium, strophanthus hispidus and strophanthus Kombe, and scilla, next to which we may place antiaris toxifera, helleborus niger, erythrolœum guinense, and nerium oleander. Besides, most of the drugs contain one or more alkaloids or glucosides, to some extent presenting the same properties. It is most likely their modes of action are very varied, but on this point much uncertainty still prevails. In one respect all the drugs are alike,—namely, besides being all of vegetable origin, they are violent poisons, and thus attracted the attention of therapeutists. Their toxic effects differ, and need further investigations; but their physiological actions in medicinal doses are better understood. They stimulate cardiac contractions, regulate the pulse, and, as a rule, produce copious diuresis. At the same time it must be confessed the differentiation of the various heart tonics and their indications still remain incomplete. So far we know, for instance, that *digitalis* is most reliable, but it is often hardly tolerated, will cause gastric troubles, and is apt to accumulate in the economy. The *convallaria* and *strophanthuses*, on the other hand, are less trusty, but are better tolerated, and will not accumulate. The *scoparius* is best for regulating the heart-beats, and strophanthus for allaying dyspnœa and angina pectoris. But all this is very vague, and the data are often contradictory, a statement applying with double force to the active principles extracted from the plants. Amidst the conflict of opinions, one clear fact stands undeniable, —that is, digitalin and strophanthin no more represent digitalis and strophanthus than morphine does opium or quinine cinchona. As to therapeutic indications, when we leave the demesne of generalities, and try to establish specific values, in my opinion the whole chapter is to be rewritten, as both physiological experiments and clinical observations have as yet been insufficient."

General discussion now being open, Dr. Masius (Liege) said his experience is that *digitalis* is by far the best heart tonic, and the powdered leaves the best preparation of digitalis. The maceration and infusion, recently recommended, are inferior, and he but seldom observed the irritating action complained of by some.

Dr. Dujardin-Beaumetz, while on most points agreeing with his Belgian *confrère*, preferred a cold maceration of the leaves as an excellent diuretic and heart tonic. We find here the powder to be irritating and ill tolerated. But Dr. Masius, supported by several members, maintained the superiority of the powder as better representing all the properties of the drug, while some of its active principles may be absent from the other preparations. On the whole, this slight divergence aside, the general opinion was that digitalis is preferable to strophanthus.

Dr. Bucquoy next read an elaborate paper on the *strophanthic pulse*, illustrated with a series of diagrams. As the memoir is to be published in full with the sphygmographic illustrations necessary for its comprehension, suffice it to say that he concluded the effects of strophanthus to be a slackening and regulating of the pulse, which takes an "aortic character." It controls asystoly through its tendency to equalize, in favor of arterial pressure, the excess of venous tension. Strophanthus is assuredly a heart tonic, possesses lasting diuretic properties, and can be tolerated for a long time. The characteristic feature of the "strophanthic pulse" is the exaggerated amplitude of the pulsations, which give it the same appearance as with "aortic insufficiency."

Dr. Féréol (Paris), and with him Dr. Semmola, having praised *digitalin*, the first meaning Nativelle's crystallized digitalin, and the second Homolle's amorphous ——, at once several members were up in arms, Dr. Stockwiss deprecating the use of violent poisons so imperfectly known, and Dr. Dujardin-Beaumetz declaring himself an uncompromising opponent of digitalins or digitoxins of all sorts until their real nature is exactly known. An exception might be made in favor of the crystallized variety as offering at least some guarantee of uniformity, but it is exceedingly poisonous. As to the amorphous varieties, and there are many, some are but little better than patent medicines, and a prudent physician should avoid them all, a conclusion which Dr. Crocq (Brussels) supported.

Dr. Constantin Paul: "Much has here been said about heart tonics, but are there really such medicaments as tonics of the heart? I confess, after hearing all that has been said, I fail to be convinced. A tonic is a medicine strengthening a certain organ, but not temporarily only; its effect should be lasting. Quinine, for instance, is a model tonic in intermittent fever. With digitalis, strophanthus, and sparteine the case is different, and so it is with caffeine, which, by the way, is not identical with theine, but an isomer. They act on the heart-beats, but

give no strength to the organ. A fatigued heart may be likened to an old steam-engine still able to give useful work under careful management. When the engine slackens an experienced engineer will see to the flues, clean and oil all around, and the old machine will go on for a good while. But have a youngster in charge, and he will force the fire and burst the boiler. In the same manner, on giving strophanthus, you cleanse the economy by copious diuresis and relieve the pressure. Even a simple punction with the thermo-cautery often greatly favors the action of cardiac medicines. But giving caffeine under such circumstances is like adding more coal under an overworked boiler. One of the best heart medicines is the *convallaria majalis*, because, after producing cardiac regularity, it will keep it up for a long time. But the active principle—*convallarin*—is useless, and so is the alcoholic extract. The best preparation is a watery extract of the root."

Dr. Stockwiss said he could not agree with the conclusion that there are no heart tonics. But to speak only of practical results, his clinical and physiological experiments convinced him that digitalis is a true heart tonic.

Dr. Féréol, while thinking it would not be very difficult to force Dr. C. Paul to admit the existence of heart tonics, agreed to a great extent with his praise of convallaria, no medicament being tolerated so long. To keep it up for years, according to his experience, all that is necessary is to exhibit it for fifteen days, and then stop fifteen days, to take it up again indefinitely, with constant and reliable effects.

FOURTH QUESTION.—*New Drugs.*

"Chemistry, Pharmacology, Pharmaco-dynamics, and Therapeutic Applications of the Plants introduced within Ten Years, or the Principles extracted therefrom."

M. Planchon (director of the Paris College of Pharmacy), *reporter:* Two contrary currents now exist in therapeutics, one tending to the introduction of new plants and new preparations therefrom, the other favoring the abandonment of vegetable substances and the substitution of either their active constituents or of chemicals formed by synthesis. The first current has set in, especially among American and English practitioners, but also on this continent. Unfortunately, with some of these new drugs, the task of the pharmacologist is not easy, a meaningless, native name, and an incomplete fragment, a leaf or a root being often all the data we have to work with. The time is no longer when cinchona was used for a century before its active principle was known. Yet we must not neglect our predecessors. For instance, when *pichi* was presented, a short time since, pharmacologists were at first much embarrassed, while, had they consulted Ruiz and Pavon's *Flore du Chili*, they would at once have found its scientific name and description. In the same manner many medicaments, long forgotten, like convallaria, coronilla, scoparius, adonis, etc., are nowadays cropping up in modern therapeutics. Although new to us, they were familiar to ancient writers, and it is wonderful what stock of information and clear knowledge can be derived from the works of Bauhin, Clusius, Lobel, and others.

At all times, when a medicament has proved satisfactory to the physician, the first thing has been to find out the best form of preparation. The idea is to extract the active principle, alkaloid or glucoside, and it must be admitted therapeutics have thus been greatly benefited. For instance, had cocaine been unknown, the effects of coca would have been difficult to explain; quinine will do what bark cannot. Some alkaloids, like cotoine and scoparine, were discovered before the drugs themselves had been identified; and some, like codeine, are made by synthesis. But at this point several important questions confront us. Should the alkaloids and glucosides be substituted for the plants, and are they always preferable to a good galenical preparation of the drug? Have they even the same properties, and are we sure they are not formed during the extraction process? And, lastly, are the principles obtained by synthesis identical as to properties with the natural? All these questions have been occasionally answered offhand by more than one physician. But prudent men still hesitate, and we think this Congress should consider such questions.

Dr. Lefevre (Louvain) spoke against the unnecessary use of active principles when they are not perfectly familiar. The entire drug possesses often some advantages, and cannot always be replaced by any alkaloids or glucosides; digitalis, for instance, is not fully represented by any of the digitalins known at present, an opinion which Dr. Crocq (Brussels) approved of.

M. Petit (Paris) said the chemical analysis of drugs is most important, not only for ascertaining its value, but for deciding which preparation is most appropriate. An instance of this necessity is the blunder made by Claude Bernard, who conducted laborious experi-

ments with "narceine" without testing the substance he was using; and now the supposed alkaloid turns out to be a myth. On the other hand, when one principle has been extracted from a plant, it will not do to conclude hastily it represents all its properties, since we know that many vegetable substances contain more than one.

Dr. Muñoz (Spain) sent in a memoir on *hazeline* as a hæmostatic, greatly praising its value. But the article was rather roughly handled when it turned out the preparation is only a proprietary one, and not an active principle, as the name indicates.

THE FIFTH QUESTION,

relating to a universal pharmacopœia, Professor Schaer (Zurich), *reporter*, occupied the remainder of the last sitting. In conclusion, the Swiss gentleman said that the projected pharmacopœia should only comprehend the most important, especially the poisonous, preparations. The text might be in any language, but preferably Latin, and the titles in Latin, with numerous synonymes. A table of maximum doses should be appended. After an exchange of views, members in the main agreeing with Professor Schaer, his report was adopted, and there are hopes that a Universal Pharmacopœia may at last be agreed upon at the coming Milan Congress in 1890, when an International Medical Congress is to meet at the same time as the Pharmaceutical, and probably in connection with it in some respects.

The usual votes of thanks having been carried, the Congress adjourned, to meet for the last time in a farewell banquet on the first platform of the Eiffel Tower. There is but little to say of this part of the exercises, save that the dinner was excellent, the wines good, and the speeches very short.

BERLIN.

(From our Special Correspondent.)

The leading members of medical circles in Berlin have, of late, been strenuously opposing the stand taken by a certain number of younger physicians in favor of the hypnotic "Suggestion Therapeusis." In one of the last meetings of the Berlin Medical Society, held before the summer vacation, one no less than Virchow endeavored to demonstrate, in an unmistakable manner, the utter worthlessness of so-called cures of organic and functional troubles by means of suggestion; but he was unable to substantiate his conclusions from any formulated basis. Most valuable, concerning this question, are the results of the investigations of one of Germany's most noted clinicians, Professor von Ziemssen, of Munich. These results he has recently reported in an address on the subject. Von Ziemssen concludes, from most extensive personal experience, that hypnotism is valueless, or, at least, that its influence can only be a passing one even in slight functional disturbances; and, furthermore, that the procedure may do actual harm to many patients. The simplest forms of nervous disorders,—toothache and other neuralgias, headache, general lassitude, nervous excitement, and sleeplessness,—these are the conditions in which, primarily, a good result is frequently obtained. It is, therefore, the symptoms of the disease and not the disease that are relieved by hypnotism, and it is but very rarely that even the symptoms are influenced in any but a passing manner. In the first forms of general neuroses, above all epilepsy, chorea, and paralysis agitans, the reported favorable results have not been obtained, and regarding the influence upon deep-seated organic disturbances there is absolutely none. When only the simplest disorders are benefited, and these only temporarily, it is surely a questionable procedure that in order to attain its ends must produce an "experimental imbecility of the brain," as Meynert aptly calls it.

In hysteria, hypnotism possesses the power of causing a decided increase of the disease when resorted to frequently. It has been known to change slight hysteria into a condition of "grande hysterie," as described by Charcot. Certain severe accompanying symptoms of hysteria, such as convulsions, contractions, paralysis, etc., can be temporarily overcome by hypnotism. However, all that is accomplished is to change one form of abnormal condition of the brain into another. The fallacy of the fundamental principles of the Nancy school may be demonstrated not only upon hysterical but also upon healthy subjects,—viz., that the hypnotic condition is related to natural sleep, although not quite identical with it. A condition is induced which borders on imbecility, which may be recognized as a lasting influence upon the cortical centres of self-consciousness and will-power, together with a hyperæsthesia of the subcortical portions of the brain. The injurious influences upon the brain, which hypnotism frequently produces, must not be overlooked, as they are both extensive

and lasting. Even now we can unhesitatingly assert that the claim of the Nancy school regarding the alleged harmlessness of hypnotism is false. Similarly one might endeavor to prove that the habitual use of hypodermic morphine injections was devoid of harm or danger. The statements are parallel. Von Ziemssen closed his address with the following words: "As yet the hypnotic influence has not reached its height with us in Germany; the enthusiasm for the wonderful curative agency is still on the increase. I, however, trust to the history of experience, which shows that the sooner the like influences reach the pinnacle of their glory, the sooner they are again precipitated to the natural level. I trust implicitly to the healthy mind of German physicians, whose scientific objectivity will teach them to deal firmly, and not be carried away with the fabulous speculations advanced by hypnotism or kindred methods." As it seems, our colleagues across the ocean are likewise endowed with this scientific objectivity.

Before us lies the report of Opitz regarding the use of antipyrin in the City Hospital of Dresden. He has observed as the result of single doses of 15 grains, or ninety-three grains daily, a considerable decrease in the quantity of urine voided by patients suffering from diabetes insipidus. Three cases are reported. After continued treatment, when other known remedies had failed, antipyrin caused an immediate abatement of the symptoms of diabetes insipidus. In the first case, the curative influence was prominent; in the second, it lasted for a long time, even after the use of the drug had been discontinued. In the third case, the amount of urine increased after the drug had been stopped, but decreased as soon as antipyrin was again resorted to. With the decrease of the urine and relief of the thirst the general condition of the patient also became greatly ameliorated, the weight increased, and sleep became natural. Two of the cases were of very long standing,—one over twenty years,—and the third case was most severe, the amount of urine voided being over sixteen quarts daily. Only once was an unpleasant accompanying symptom noticed, and that soon passed over. On one occasion the administration of the remedy was followed by vomiting and loss of appetite. The dosage should best be undertaken as follows: Thirty-two grains daily to begin with, in 7- or 15-grain doses, this in order to test the sensibility of the patient towards the drug. Then an additional fifteen grains can be administered daily until about ninety-three grains (six grammes) are being given daily, and the decrease in the quantity of urine is well marked. After about eight days of treatment the drug should be discontinued in order to test the duration of its effects, and should again be resorted to when found necessary, the dose required having definitely been determined.

Notes and Queries.

A CASE OF ESSENTIAL EPILEPSY CURED BY TREPANNING THE CRANIUM.

BENDANDI communicated in his own name and that of DR. BOSCHI, to the Medical Chirurgical Society of Bologna, March 22, 1889, an interesting account of a case of essential epilepsy cured by trepanning (*London Medical Recorder*, July 20, 1889). Patient's history showed that he was of rather dull intellect, without hereditary disease, and non-syphilitic. When a child he had a blow with a stone on the occiput, but this was followed by no consequences. At eighteen an epileptic attack first appeared, after a fright. In the first year the attacks recurred once or twice a month, then became gradually less frequent, until for a period of ten years he only had three or four attacks in the twelvemonth. In 1888 they became very frequent, even two a day. When he first came under the author's observation, right hemiparesis with contraction of the flexor muscles of the right arm, and drawing of the right facial angle, was noticed. From the course of the disease and the character of the patient, and from the mode of onset of the convulsions, hysteria and hystero-epilepsy were out of the question. The clonic spasms and phenomena of depression of motility on the right half of the body, and the spasm of the facial on the right, all induced the authors to consider the case one of essential epilepsy, to which was joined some special lesion with a focus localized in the left cerebral motor zone. With the idea of removing this lesion, the authors determined, by a method similar to that indicated by Giacomini, the situation of the fissure of Roland, and thence the centres which could be affected by the lesion, and, using a trephine with a diameter of one centimetre, four times they made an ample breach, having for its centre the point already determined. Not finding above the dura mater evident

signs of lesion, they made in it a cruciform incision. A tablespoonful of colorless serous fluid escaped; this did not appear encapsuled, but seemed like the cephalo-rachidian fluid. The convolutions were flattened as if by compression, and softer than normal. To explore the subjacent tissue an incision was made by the bistoury for a depth of three centimetres. The finger was introduced into the wound, and no signs of suppuration or extravasation was found, the surrounding tissues only appearing abnormally soft; in a word, only œdema limited to the part explored was found. The dura mater was closed by catgut, the breach in the cranium was left open for the escape of any fluid that might be formed, and the cutaneous wound closed by the usual interrupted suture. The temperature never rose above 38° C., and the patient complained of slight dull pain in the cut, but nothing else. The attacks, which had been twice daily, appeared no more. In the twenty days succeeding the operation the hemiparesis increased in relation, perhaps, to the cerebral wound and the consequent exudation. But after this the improvement was steady, and now, two months after the operation, there have been no more attacks, and there is great gain in motility, the patient being able to write well, which he could not do before.

MANDRAGORINE—A NEW ALKALOID.

From the root of mandragora (*M. autumnalis* and *vernalis*), in olden times so highly esteemed as a sedative and an ingredient in love-potions, F. B. AHRENS has obtained an alkaloid which he calls mandragorine. This is a hard, brittle resin, melting at a temperature of 77° to 79° C., and uniting with sulphuric acid to form glittering crystalline scales, which dilate the pupil when outwardly applied. The free base is represented by the formula $C_{17}H_{23}NO_3$, consequently, although proved to be a distinct substance, it is isomeric with atropine, hyoscyamine, and hyoscine.—*Druggists' Circular*, August, 1889.

THE CONSTITUENTS OF LYCOPODIUM SEEDS.

A number of interesting studies have been recently published as to the constituents of lycopodium seeds. LANGER found in the spores 49.34 per cent. of oil, which contained glycerides of two new acids, having the formulæ of $C_{16}H_{30}O_2$ and $C_{16}H_{30}O_3$. The first spores yielded only the former acid, older spores only the latter.

From the comparison of the therapeutic action of these two fatty bodies, the explanation will, perhaps, be found of the remarkable fact that sometimes in vesical catarrh, gonorrhœa, etc., lycopodium seeds possess most positive properties, while in the majority of cases they are without value.

Further, BUKOWSKY has found that the oil from the fresh lycopodium seeds is a mixture of a glyceride of a new acid, $C_{18}H_{36}O_4$, which he terms lycopodic acid, with other known fats.

Which of the above formulæ is the correct one is still undecided. On account of the ready decomposition of the oils, they should be administered in capsules for therapeutic purposes.—*Wiener Medizinische Wochenschrift*, July 27, 1889.

THEOPHYLLIN—A NEW CONSTITUENT OF TEA.

This new base, obtained from the alcoholic extract of tea, agrees in its elementary composition, $C_7H_8N_4O_2$, with that of theobromin and paraxanthin, but differs from both of these substances in its melting-point, mode of crystallization, and behavior with caustic soda.

It gives no xanthin reaction, but on evaporation with chlorine-water leaves a scarlet-red residue, which turns violet with ammonia, and is decolorized by excess of caustic soda. This body is described by KOSSEL, who discovered it as a dimethylxanthin.—*Centralblatt für Klinische Medizin*, July 27, 1889.

OIL OF EUCALYPTUS IN HEADACHE.

In the *Medical News* of July 20, 1889, DR. MORRIS J. LEWIS and DR. G. E. DE SCHWEINITZ report several cases of headache benefited by the use of the oil of eucalyptus, in doses of 5 minims, given from four to six times daily. In one case 20 minims were given with the apparent result of preventing the attack of headache, of which premonitory symptoms were already present. In their first case a malarial element was present, and the drug was prescribed for the malarial trouble rather than for the headache, but the great improvement of the latter symptom led them to employ the drug in cases where there was no malarial history. They believe that the greatest relief from the use of eucalyptus

will be found in headaches of the congestive type. They did not succeed with the drug in one case where the attack was brought on by an indiscretion in diet, although the patient obtained relief at other times; and in one case of ciliary neuralgia failure is reported; also in two others where there was organic disease of abdominal viscera.

A POISONOUS DERIVATIVE FROM CHLORAL AND GLUCOSE.

A. HEFFTER reports that when equal parts of pure anhydrous glucose and chloral are heated together in a closed vessel on a water-bath, a chemical combination takes place, resulting in the formation of two different compounds.

When the heat has been continued for about two hours, the mass appears homogeneous and dark brown, viscid while hot, and almost as hard as glass when cold. This mass was dissolved in alcohol, and the alcoholic solution diluted with much hot water, which caused the separation of resinous drops. The latter were filtered off, and the solution evaporated until all alcohol and remaining free chloral were dissipated. It was then diluted with water, filtered, and set aside to crystallize. The first crop of crystals, after purification, appeared in form of thin lamellæ of a mother-of-pearl lustre, which were tasteless, and were found to be free from any poisonous qualities. The mother liquid, on further evaporation, deposits star-shaped groups of needles, which, when purified, are white, but little soluble in water (1 in 154), and have a bitter taste. Their composition is $C_6H_{10}O_5.C_2HCl_3O$, or $C_8H_{11}O_6Cl_3$, there being a loss of one molecule of water [which *may* be derived from the glucose alone, as expressed by the first formula, which the author of the paper does not venture to assume].

This new compound is very poisonous, even in small quantities, and is being studied pharmacologically at present. Further information is promised shortly.—*American Druggist*, August, 1889.

A NEW TOPICAL PREPARATION OF IODINE.

M. EYMONNET uses paper free from size, which he saturates with iodide of potassium, and another paper similarly treated with iodate of potassium and tartaric acid. These papers, separated by a very thin sheet of plain paper, are then brought together with gutta-percha fasteners and enclosed in a thin sheet of gutta-percha. Plasters thus made will keep indefinitely, and the iodine does not appear until the paper is immersed in water. On application, iodine is disengaged from the paper during about forty-five minutes. The amount disengaged is about thirty centigrammes for each leaf. The author states that an application of these leaves for forty or fifty minutes produces better effects than can be had by five or six hours application of iodized cotton, or five or six paintings with the tincture. The plasters do not burn the skin, and are tolerated for from half an hour to an hour. When necessary they may be covered with gutta-percha, and the clothing thus be protected.—*American Journal of Pharmacy*, August, 1889.

SAFRANIN—A NEW REAGENT FOR SUGAR.

GRISMER has recently recommended the following as an admirable sugar test: 16 drops of urine are diluted with 5 times the volume of the safranin solution (1 to 1000), and boiled with 30 drops of caustic potash solution. If the urine contains sugar the solution is decolorized. This test possesses the advantage over Fehling's test, in that it is not decolorized by uric acid, creatinin, chloral, chloroform, peroxide of hydrogen, or salts of hydroxylamin. On the other hand, the solution of safranin and urine is completely decolorized by albumen, but only after very prolonged contact. Sometimes perfectly normal urine appears to decolorize safranin, but if this specimen of urine is subjected to the fermentation test it will always be found to contain a minute quantity of sugar. —*Wiener Medizinische Blätter*, July 25, 1889.

THE CURABILITY OF HEPATIC CIRRHOSIS.

The etiology of hepatic cirrhosis, if generally due to alcoholism or malarial infection, is still sometimes unknown. The most frequent cause is concentrated alcohol, most hurtful when taken on an empty stomach, as it is then most quickly absorbed. The veins which carry it from the stomach become irritated, and the irritation, extending from the portal veins, engenders an inflammatory process of the perivascular connective tissue, which, little by little, leads to hepatic sclerosis. As long as the hepatic lesion is limited to an embryonal neoformation, although ex-

tensive, SEMMOLA affirms that a good result is to be hoped from a rigorous milk diet. When, however, the atrophic process has become complete, the advantage obtained from milk diet can only be palliative. Clinical symptoms do not always tell us with which stage we have to deal; ascites, not being only determined by a mechanical cause, may be great, while the cirrhosis is still curable. On the other hand, there are cases of cirrhosis with no ascites at all up to the end. As an aliment milk entails the least work for the stomach, satisfies the needs of the general nutrition. The irritated gastric mucous membrane is the first to feel the good effect, and this is propagated to the other parts of the digestive tract, with its annexes, liver, etc. Not only is milk easily digestible, but it furnishes peptones, which facilitate tissue change, and thus milk diet increases the quantity of urea eliminated in the twenty-four hours. In all these ways, and by increased diuresis, rigid milk diet tends to improve the morbid conditions proper to hepatic cirrhosis.—*London Medical Recorder*, July 20, 1889.

NEW LANOLIN OINTMENTS.

DR. STERN, of Mannheim, has found to be useful three preparations with lanolin, which he names (*Therapeutische Monatshefte*, February, 1889) (1) sapolanolin, (2) lanolin wax-paste, and (3) fluid lanolin injection. The first is a mixture, usually, of 2 parts of green soap and 2½ parts of lanolin. With this he incorporates all the ordinary medicaments, excepting salicylic acid. He has found it specially valuable in the treatment of infiltrated eczema, parasitic diseases, and seborrhœa with thick crusts. With the addition of ten per cent. of white precipitate it renders excellent service in psoriasis capitis, usually clearing up the disease in from three to eight days' time, and needing only the application of an indifferent ointment to complete the cure. It never discolors the hair. The second preparation is exceedingly useful for an adhesive dressing, and is composed of 40 parts each of yellow wax and lanolin and 20 parts of olive oil, melted together, and shaken while cooling. It is of a bright yellow color, and of the thickness of the wax used by the hairdresser. It can be spread upon the skin, where it sticks. With this can be incorporated nearly all sorts of medicaments, only, when tar is added, a little more wax must be used. It is very useful in eczema of the face when oxide of zinc or boric acid is added to it. In squamous and vesicular eczema the following leaves little to be desired: Salicylic acid, in fine powder, 3 parts; olive oil, 17 parts; yellow wax and lanolin, each 40 parts. For the third preparation the basis is formed by lanolin, 25 parts; oil of almonds, 75 parts. To this can be added various medicaments, for instance: ℞ Zinc sulphate, 5 per cent.; water, 4.5 per cent.; lanolin, 20 per cent.; and oil of almonds, 75 per cent.—*New York Medical Journal*, August 3, 1889.

A NEW PROCESS FOR THE TREATMENT OF SEWAGE.

A private demonstration was given at the Wimbledon Sewage Farm on Friday last of a new process for the treatment of sewage which is known as the "Amines" process. Among those who were present were Lord Rosebery, Dr. Klein, Dr. Hake, Dr. Campbell Pope, Dr. Abraham, Mr. Percy Dunn, Mr. Chatterton, Dr. Lloyd, Mr. John Barker, Mr. Bennett Williams, and others. The process consists in mixing with a solution of lime a certain proportion of "herring brine," and then passing the mixture into the crude sewage, which is afterwards in the ordinary way passed along the culverts into the settling tanks. It is claimed for the process that it recognizes the fact that the principal evil to be dealt with is the presence in sewage in teeming numbers of bacteria, to whose vitality the putrefaction of the organic matters in solution and all the attendant phenomena are primarily to be attributed. The result of the chemical union of the two substances above mentioned is the evolution of "Amine" gas, which is very soluble, and spreads with great rapidity through every part of the liquid sewage. By experiment this gaseous reagent has been found to be antagonistic to the existence and propagation of every species of bacteria occurring in sewage and other similar waters. Thus, the effluent, after the sewage has been treated by the "Amines" process, is found, according to Dr. Klein, to be perfectly free from microorganic life, and it is at the same time inodorless and without color. These facts, which were shown to the visitors at Wimbledon on Friday last by Mr. Ellice Clark, together with other interesting details, which are shortly to be made public, were incontestable as far as they went. Undoubtedly a great step has been made towards the solution of the great problem of sewage treat-

ment by the discovery of a reagent by which sewage can be practically and effectively sterilized. We shall be glad to refer to this matter again as soon as we come to learn something more of its practical application. The London County Council would be well advised to permit an experiment to be made of this process at the pumping station at Crossness.

PRIMULA OBCONICA.

The favorite greenhouse plant, *Primula obconica*, appears to possess either irritant or poisonous properties, which render it as unsafe to handle as the poison oak (*Rhus toxicodendron*). Attention was called to this property of the plant by a writer in the *Garden and Forest* some months since, and the statement has been confirmed by others in the *Garden* (April 20, p. 368, and July 13, p. 35). It would appear, however, that it is only certain individuals with an abnormally sensitive skin who are thus affected, shown by the fact that one of the persons also experienced irritation from contact with the fruits of *Acer macrophyllum* and *Ostrya virginica*, which are covered with minute hairs. In some cases troublesome inflammation of the face and hands resulted from the handling of the *Primula obconica*. It does not appear to have been ascertained as yet whether the irritation is due to hairs or to a volatile acrid principle, as in the Anacardiaceæ. The unbranched jointed hairs themselves are apparently not adapted for causing mechanical irritation, having somewhat obtuse apices. They appear to secrete, however, a viscid yellowish substance, which is found coating their apices. The leaf, when chewed, leaves a tingling or acrid sensation on the tongue.—*Pharmaceutical Journal and Transactions*, July 27, 1889.

THE TREATMENT OF INSOMNIA.

According to the Berlin correspondent of the *Medical Press* (July 31, 1889) at the meeting of the Society for Medicine of the 1st inst., HERR JASTROWITZ gave an address on the subject. He first spoke of the employment of alcohol in its various forms of wine, beer, and spirits. Alcohol was given as a narcotic in acute diseases in cases in which it was desirable to use one that was not a cardiac depressant. Alcohol was first a cardiac whip, and then when the stimulant action had passed off a "somniferum." In chronic insomnia from cerebral disturbance it was a well-known prescription to make patients work hard or run fast, and then give them some strong beer. But even if alcohol was useful in furthering sleep, in melancholics the dread and nervous excitement were often made worse the following morning.

As regarded opium and morphine, it was a noteworthy fact that G. Mayer, of Aachen, considered them first as sedatives, and hypnotics only in large doses. A third property, that of a tonic, was very valuable. Persons who had become accustomed to take other hypnotics, after taking opium and morphine thought that the sleep following these was the most natural. These were indispensable sedatives in such diseases as cancer and tabes. It might be disputed that morphine was a tonic, but the experiences of sportsmen on themselves and their horses showed that after the injection of morphine they were able to accomplish greater feats than without. The effect of morphine in stenocardia, angina pectoris, and feeling of dread from deficiency of tone in the medulla oblongata, were mentioned. In congestion of the chest great caution must be used with morphine, as well as in diseases of the heart, as both paralyze the heart. These drugs must be used with great caution in chronic insomnia, for fear of setting up a dangerous and intractable morphine habit. Small doses only should be given to children in whooping-cough, and bromide of potassium substituted where it could be done. In senile insomnia, opium acted better than morphine; was superior also in intestinal diseases and in certain forms of melancholia and mania. He had used it gladly in delirium tremens. Codeine and narceine were the only other alkaloids from opium in use. Both caused less constipation, and were fairly good hypnotics. In Russia and France codeine was much used in bronchitis, and Lauder Brunton recommended it in abdominal pains. Narceine was much used in France for children. Chloral hydrate had the advantage of being the most powerful of all hypnotics. It never failed. Danger from it naturally increased with the dose. A large dose of chloral produced a condition resembling chloroform narcosis, which lasted till natural sleep followed. It was contraindicated in cases where the lungs showed great obstacles to respiration, and where the stage of excitation was very short, especially where there was no contraction of the pupils. He had in 1869 recommended a mixture of chloral and morphine; it had ad-

vantages, but it should never be given in large doses. Paraldehyde did not depress the heart. Large doses produced a condition resembling chronic alcoholism. It was not very dangerous. Patients quickly got accustomed to it, and the dose had to be increased. It was not suitable in bronchial irritations, but in affections accompanied by cutaneous itching it was very efficacious. It was not very useful in conditions of great excitement and dread, but in insomnia from "moral" causes it was. Hydrate of amyl had the fate to be quickly overtaken by sulphonal, but it was a good hypnotic in doses of .8 to 1 gramme (12 to 15 grs.).

Sulphonal was distinguished by its odorlessness and tastelessness, so that it could easily be given to unwilling patients. All observers were agreed that it did not act on the heart. The action was very slow, so that it was not so suitable for acute affections. It did not relieve pain, but it was unreplaceable in cases distinguished by motor restlessness, such as chorea. In mania it was best to give ½ to 1 gramme during the day and another dose in the evening. After long-continued use the patients suffered from giddiness, so that they staggered in their walk. Patients declared that they felt stupid, they could not move their arms or legs properly. These symptoms disappeared when the medicine was stopped. Urethan, methylal, and hypnon, from their being unsafe or unreliable, had fallen into disuse. All comparison of these drugs was possible only to a slight extent. The sleep after sulphonal was most like the natural. With long continuance it was not without its effect upon the heart.

ANTIPYRIN INCOMPATIBLES.

A short time since M. Carles called attention to a precipitate which is formed upon mixing solutions of antipyrin and extract of cinchona. M. Ollivier, who has been making further experiments, says (*Bull. Comm.*, June, p. 278) that all the active principles are precipitated together, and that there remain in the liquid hardly any perceptible traces of alkaloids or antipyrin. According to M. Carles, however, the precipitate is readily soluble in weak acids, so that it might dissolve in the gastric juice, and the mixture, though unsightly, might not be inert. Another apparent incompatibility has been recorded by M. Blainville (*loc. cit.*), who, having occasion to mix four grammes of antipyrin and five grammes of chloral hydrate in fifteen grammes of water, observed that the mixture assumed a milky appearance, and upon clearing deposited an oleaginous liquid. After decantation, this liquid soon crystallized, and then no longer possessed the taste of antipyrin or of chloral, but a flavor rather resembling that of coriander-seeds. Attention is called to the inconvenience that may result from the prescribing of complex substances, of which so little is known, together with other chemical substances, that may change their physiological action altogether, and it is recommended, as far as possible, when ordering them, simple formulæ, in which only distilled water and a simple flavoring agent enter, should be adopted.—*Pharmaceutical Journal and Transactions*, July 27, 1889.

RELIEF OF STRANGURY.

Dr. Luton, of Rheims, having highly recommended tincture of ergot internally for the immediete relief of strangury, we were recently induced to try a hypodermic injection of ergotin for the same purpose, inserting it in the fossa just behind the great trochanter. The results were all that could be desired. The patient had had a hypodermic injection of morphine about an hour previously, and was considerably under its influence when we were applied to for relief.—*National Druggist*, August 15, 1889.

CREOLIN INJECTIONS IN DYSENTERY.

Dr. Sosovski has found large enemata of dilute creolin very useful in dysentery. He employed a one-half per cent. solution injected into the bowel twice, or sometimes three or four times, daily, the quantity used for each enema being generally about five pints. The patients did not experience any burning sensation or abdominal pain. The treatment was employed in sixteen cases, not one of which proved fatal, although a considerable number of patients succumbed to the disease during the same epidemic. In two cases the disease was arrested after the second enema, in nine cases the bloody stools ceased on the third day, in two cases on the fifth day, in one on the sixth, and in one on the ninth. The remaining case, though more obstinate, ultimately recovered completely. In addition to these, two children under a year old were treated successfully by means

of creolin enemata. Again, another Russian physician, Dr. Kolokoloff, has used a one per cent. solution in a number of cases of adults with complete success.—*Lancet*, August 3, 1889.

ŒDEMA OF THE BRAIN.

According to Dr. Hugenin, of Zurich, inflammatory œdema of the brain or diffused encephalitis occurs after perforating wounds of the skull with injury to the brain, also in tumors of the brain where the centre breaks down and softening is going on towards the periphery, also in abscess and infectious diseases of the brain, and more rarely in cases where there is hemorrhage or a hemorrhagic infarct. It is, however, to the non-inflammatory variety of cerebral œdema that Dr. Hugenin has devoted his attention specially. Having made a large number of post-mortem examinations in cases of this kind, he has come to the conclusion that so long as the vessels within the cranial cavity maintain their normal condition, there is no fear of any fatal œdema resulting from circulatory disturbance in cerebral disease; but when there exist such morbid conditions as obliteration of the lymphatics or increased intra-cranial pressure, due to diminution of the cranium, or more particularly to an arrest of its ordinary growth, fatal œdema of the brain may be induced. He found that in children who had died from hyperæmia or œdema of the brain or slight hydrocephalus there was commencing meningitis, usually of an infectious character,—that is to say, due to the presence of streptococci. Fatal congestive œdema in children was found to occur only when there was obliteration of the channels leading from the space beneath the pia mater or obliteration of the Pacchionian bodies, such as is set up in the course of chronic meningitis.—*Lancet*, August 10, 1889.

USES OF SODIUM ETHYLATE.

In the *Practitioner* for August, 1889, Dr. Arthur Jamison writes that he has found sodium ethylate to be extremely useful for the removal of hairy moles which so often disfigure the face, especially in women. The mode which he employs is to cut the hairs as close to the mole as can be done with a very fine pair of scissors, and then paint it over with sodium ethylate by means of a fine glass rod.

When the mole has a varnished look from the application, he gently rubs the ethylate in with the glass rod to make it penetrate more deeply into the hair-follicles, being very careful not to let any of it run off the mole on to the skin of the face.

After the operation the mole will have a black look, and a hard crust will form over it, which will be nearly three weeks in becoming detached. When it comes off the hair will be destroyed, and the surface of the mole will have a somewhat cicatricial appearance of a much lighter color than before. Dr. Jamison also mentions that in those vascular areas seen on the sides of the nose in children, formed by vessels radiating from a common centre, a very small drop of the ethylate applied with a fine glass point to the very middle of the vascular area destroys or obliterates the vessels below, and then those radiating from it disappear, and no mark at all is left.

TO ABORT BOILS.

A writer in the *Medicinische Wochenschrift* says that a boil may be aborted in a very simple manner. If the skin over the site of the threatened invasion be scraped with a scalpel until a drop or two of blood exudes on pressure, further progress will be stayed. This must be done just as soon as possible after the first sensations of the coming furuncle are experienced.—*National Druggist*, August 15, 1889.

THE RATIONALE OF THE BROWN-SÉQUARD TREATMENT.

In the *Medical Age* for August 26, 1889, is published a paper with the above title, emanating from the Chemical Laboratory of Parke, Davis & Co. In this it is suggested that whatever value may be attached to the solution, proposed by Brown-Séquard as a nerve stimulant, is, perhaps, attributable to the alkaloid *spermine*, and an account is given of several experiments, both on man and animals, in which the hypodermic injection of $\frac{1}{40}$ of a grain of the hydrochlorate of spermine appeared to produce marked stimulating effects. The claims of Brown-Séquard, so grossly exaggerated and misstated in the daily press, have not been by any means disproved. His method of experimenting is, however, open to the danger of the production of septicæmia; and, since such a risk does not attend the employment of the alkaloid spermine, experiments as to the properties of the latter are by no means out of place.

VISUAL
ARTS